

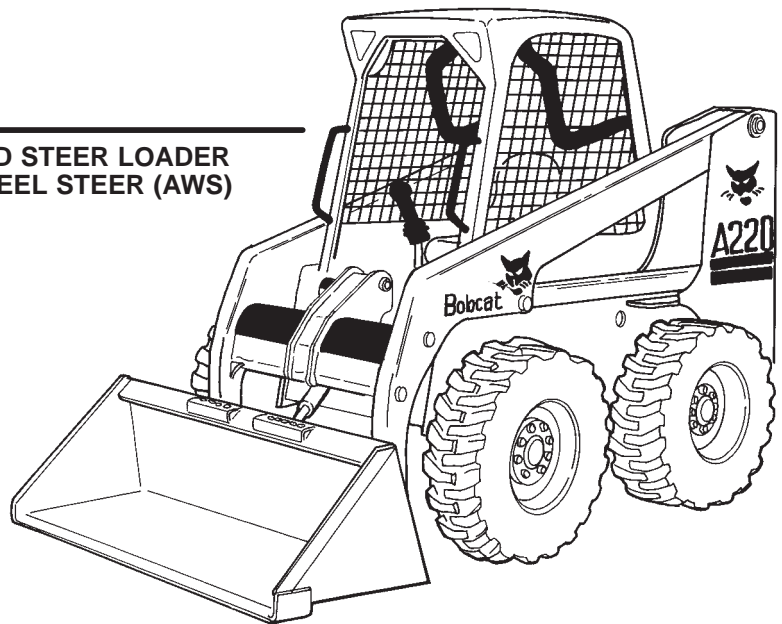


Bobcat®

Operation & Maintenance Manual

S/N 519611001 & Above
S/N 519711001 & Above

BOBCAT SKID STEER LOADER
With ALL WHEEL STEER (AWS)



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**EQUIPPED WITH
BOBCAT INTERLOCK
CONTROL SYSTEM (BICS™)**

6901243(3-03) Revised (5-12) (7)

An **IR** Ingersoll-Rand business

Printed in U.S.A.

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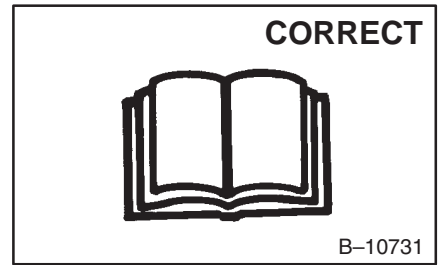
OPERATOR SAFETY WARNINGS



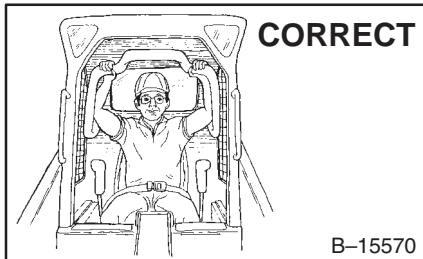
WARNING

Operator must have instructions before running the machine. Untrained operators can cause injury or death. W-2001-1285

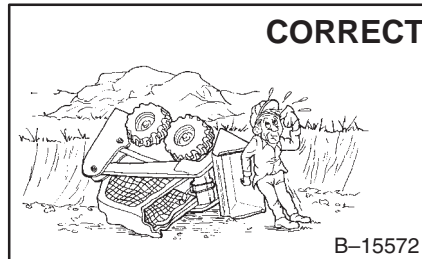
! Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



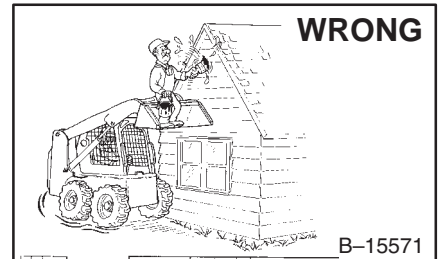
! Never use the loader without instructions. See machine signs (decals), Operation & Maintenance Manual and Handbook.



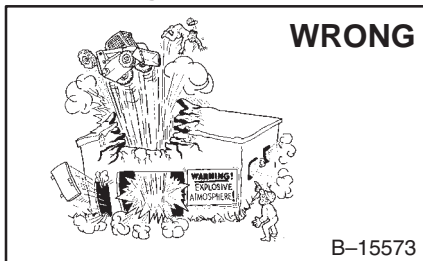
! Always use the seat bar and fasten seat belt snugly.
! Always keep feet on footrests and hands on controls when operating loader.



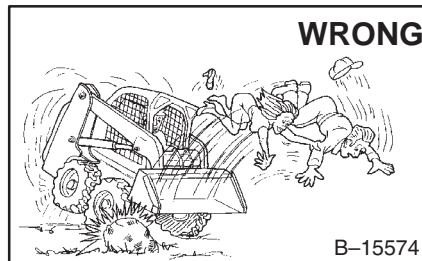
! Never use loader without operator cab with ROPS and FOPS approval. Fasten your seat belt.



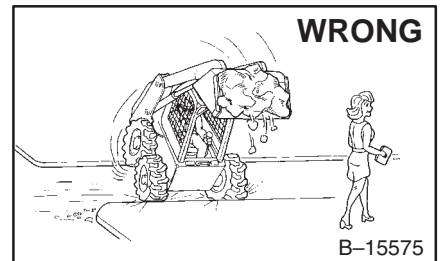
! Never use loader as man lift or elevating device for personnel.



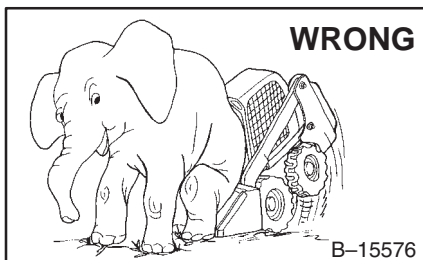
! Do not use loader in atmosphere with explosive dust or gas or where exhaust can contact flammable material.



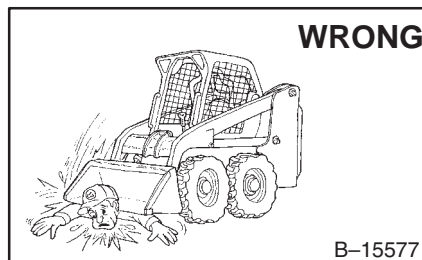
! Never carry riders.
! Keep bystanders away from work area.



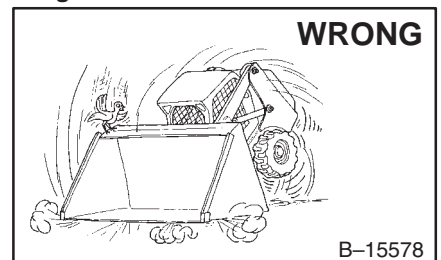
! Always carry bucket or attachments as low as possible.
! Do not travel or turn with lift arms up.
! Load, unload and turn on flat level ground.



! Never exceed rated operating capacity.



! Never leave loader with engine running or with lift arms up.
! To park, engage parking brake and put attachment flat on the ground.



! Never modify equipment.
! Use only attachments approved by Bobcat Company for this model loader.

SAFETY EQUIPMENT

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

1. SEAT BELT: Check belt fasteners and check for damaged webbing or buckle.
2. SEAT BAR: When up, it must lock the loader controls.
3. OPERATOR CAB (ROPS and FOPS): It must be on the loader with all fasteners tight.
4. HANDBOOK: Must be in the cab.
5. SAFETY SIGNS (DECALS): Replace if damaged.
6. SAFETY TREADS: Replace if damaged.
7. GRAB HANDLES: Replace if damaged.
8. LIFT ARM SUPPORT DEVICE: Replace if damaged.
9. PARKING BRAKE
10. BOBCAT INTERLOCK CONTROL SYSTEM (BICS™)



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FOREWORD

SAFETY

**OPERATING
INSTRUCTIONS**

**PREVENTIVE
MAINTENANCE**

**SYSTEM SETUP
& ANALYSIS**

**MACHINE SIGN
TRANSLATIONS**

SPECIFICATIONS

**CALIFORNIA
PROPOSITION 65 WARNING**
Diesel engine exhaust and some of its
constituents are known to the State of California
to cause cancer, birth defects and other
reproductive harm.

REFERENCE INFORMATION

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

Loader Serial Number _____
Engine Serial Number _____

NOTES: _____

YOUR LOADER DEALER: _____
ADDRESS: _____
PHONE: _____

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

Bobcat Europe
J. Huysmanslaan 59
B-1651 LOT
BELGIUM





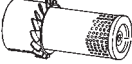



Bobcat Company is ISO 9001 certified

ISO 9001 is a set of international standards that control the processes and procedures which we use to design, develop, manufacture, distribute, and service Bobcat products.

British Standards Institute (**BSI**) is the Certified Registrar Bobcat Company chose to assess the Company's compliance with the ISO 9001 set of standards. The BSI registration certifies that the two Bobcat Company manufacturing plants and the Bobcat Company corporate offices (Gwinner, Bismarck & West Fargo) in North Dakota are in compliance with ISO 9001. Only certified assessors, like BSI, can grant registrations.

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

REGULAR MAINTENANCE ITEMS

	6665603	ENGINE OIL FILTER (6 Pack)	
	6667352	FUEL FILTER	
	6666375	AIR CLEANER, OUTER	
	6666376	AIR CLEANER, INNER	
	6661248	HYDROSTATIC FILTER	
	6661807	HYDROSTATIC FILTER IN LINE	
	6665427	BATTERY	
	6563328	FLUID Hydraulic/Hydrostatic – 5 Gallons (2–2.5 Gallon Containers)	
<u>12 Qts.</u> 6657299	<u>Gal.</u> 6724558	<u>2.5 Gal.</u> 6674204	MOTOR OIL 15W40 CE/SG
6657301	6724557	6674205	MOTOR OIL 10W30 CE/SG
6657303	6724559	6674206	MOTOR OIL 30 CE/SG

FOREWORD

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

SERIAL NUMBER LOCATIONS v . .
DELIVERY REPORT v . .
BOBCAT LOADER IDENTIFICATIONvi .
FEATURES AND ACCESSORIESvii.



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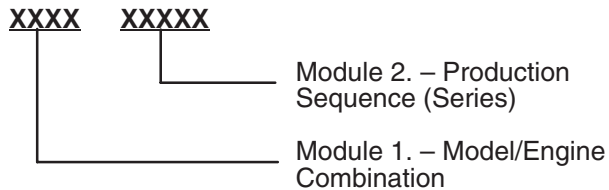
SERIAL NUMBER LOCATIONS

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

LOADER SERIAL NUMBER

The loader serial number plate is located on the outside of the loader frame [A].

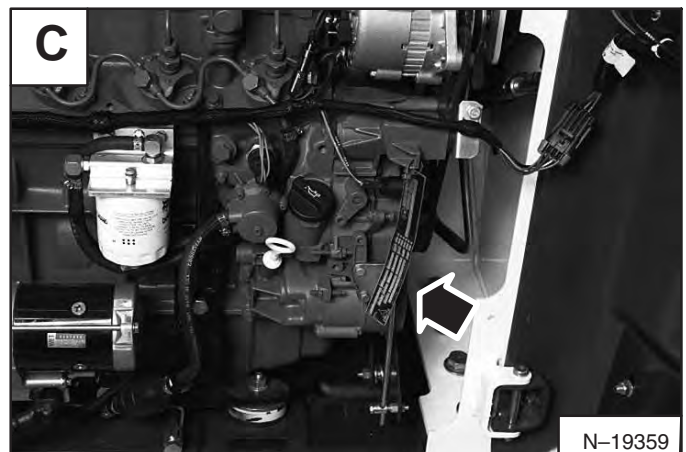
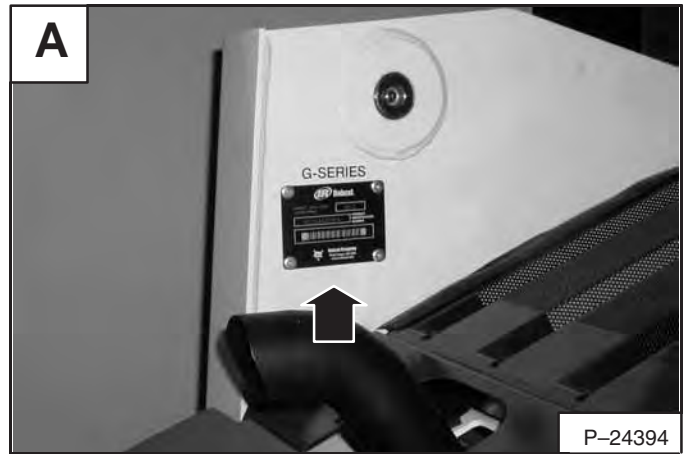
Explanation of loader Serial Number:



1. The four digit Model/Engine Combination Module number identifies the model number and engine combination.
2. The five digit Production Sequence Number identifies the order which the loader is produced.

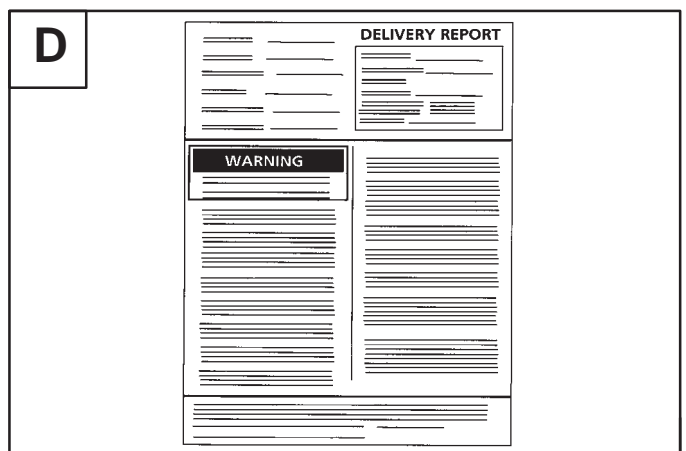
ENGINE SERIAL NUMBER

The engine serial number is located on the valve cover at the right side of the engine [B]. There is also an extra S/N tag attached to the engine [C].

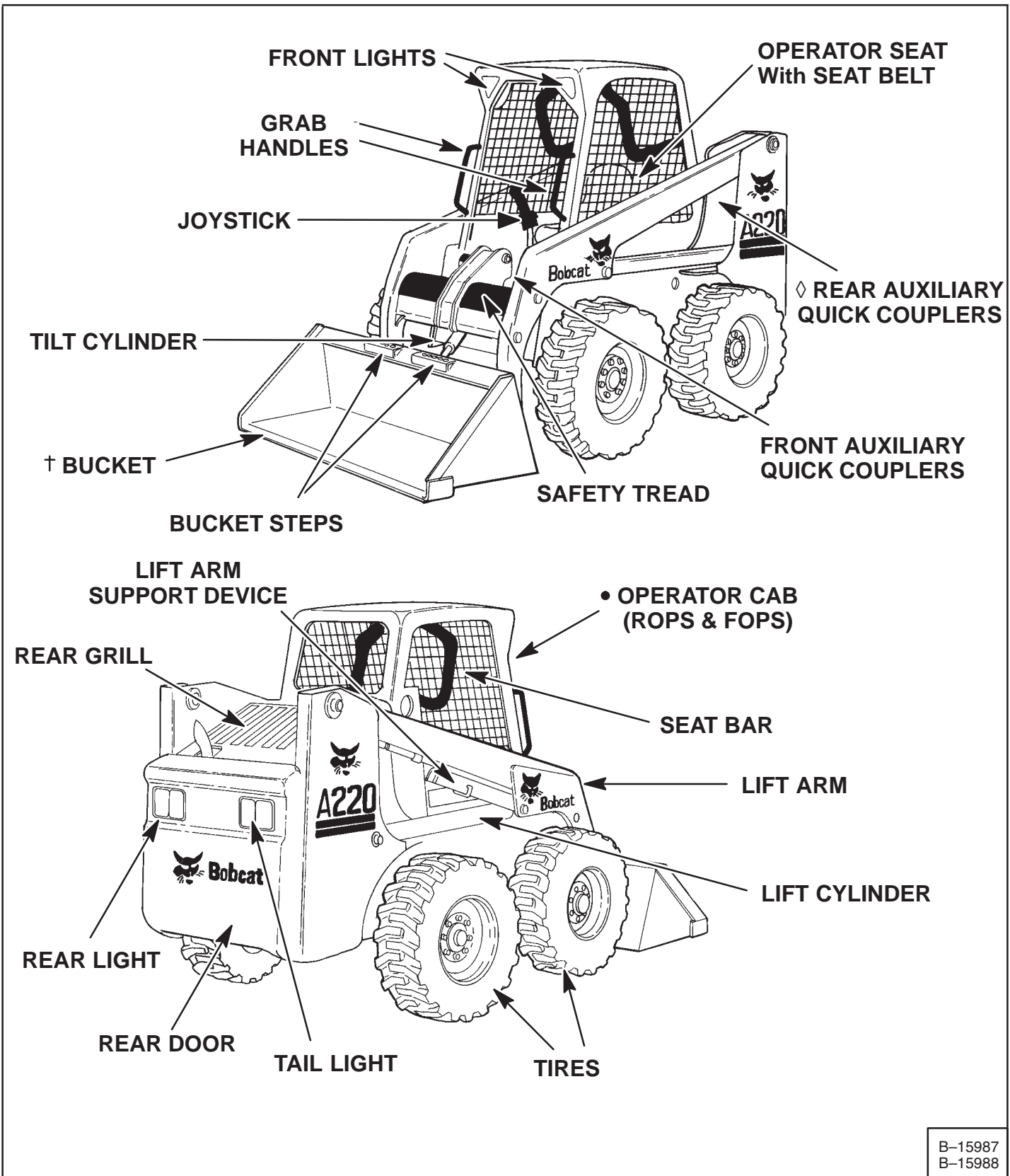


DELIVERY REPORT

The Delivery Report must be filled out by the dealer and signed by the owner or operator when the Bobcat loader is delivered. An explanation of the form must be given to the owner. Make sure it is filled out completely [D].



BOBCAT LOADER IDENTIFICATION



B-15987
B-15988

- ◇ OPTIONAL OR FIELD ACCESSORY (Not Standard Equipment)
- BUCKET – Several different buckets and other attachments are available for the Bobcat loader.
- † ROPS, FOPS – Roll Over Protective Structure, per SAE J1040 and ISO 3471, and Falling Object Protective Structure per SAE J1043 and ISO 3449, Level I. Level II is available. The Bobcat loader is base-equipped with a standard operator cab as shown. Extra insulated cab is available as an option (Reduced noise level).
- OPERATOR CAB (ROPS & FOPS)

FEATURES AND ACCESSORIES

Model A220 Bobcat loaders are equipped with the following standard items:

- Adjustable Seat
- Automatically Activated Glow Plugs
- Auxiliary Hydraulics: Variable Flow / Maximum Flow
- Bob-Tach
- Bobcat Interlock Control System (BICS™)
- Dual Path Cooling System
- Engine/Hydraulic System Shutdown
- Instrumentation: Hourmeter Engine Temperature and Fuel Gauges and Warning Lights
- Lift Arm Support Device
- Lights, Front and Rear
- Operator Cab (with ROPS & FOPS Approval)
- Parking Brake
- Seat Bar
- Seat Belt
- Spark Arrestor Exhaust System
- Steering Mode Selection (Skid Steer / All Wheel Steer)
- Tires (12 x 16.5 Bobcat Heavy Duty, 10 Ply Rating)
- Turbo-Charger
- Two-Speed Control (Later Models Only)

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

Accessory Wire Harness	Lift Kit(s)
Adjustable Suspension Seat (Vinyl) (Cloth Option) (Std. with 2-Speed Option)	Locking Fuel Cap
Air Conditioned Cab	Power Bob-Tach
Attachment Control Device (ACD)	Rear Auxiliary Hydraulics
Back-up Alarm	Rear Window Wiper
Catalytic Exhaust Purifier	Side Window Kit
Cab Enclosure Kit	Seat Belt with 3-Point Restraint Kit
Cab Enclosure (Vinyl)	Seat Belt – 3 inch Wide Kit
Counterweight Kit	Special Applications Kit
Cover Kit (Footrest Area)	Tailgate Lock
Deluxe Cab Kit	Tires
Deluxe Sound Cab	Ultra Grip Tread
Deluxe Instrumentation (With Keyless Start)	Flotation
Dual Attachment Control Kit	Solid
Engine Heater	Top and Rear Cab Windows
Fire Extinguisher	Two-Speed Travel
FOPS Kit (Level II)	Warning Lights
Front Door Kit	Four-Way Flasher (Includes Direction Signals)
Heater Kit	Rotating Beacon
Horn	Strobe Light
Hydraulic Bucket Positioning (Includes On/Off Selection)	Weighlog Kit

***Specifications subject to
change without notice***



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SAFETY

SAFETY INSTRUCTIONSxi, xii
FIRE PREVENTIONxiii.
MACHINE SIGNS (DECALS)xiv, xv

SAFETY



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SAFETY INSTRUCTIONS FOR BOBCAT SKID-STEER / ALL WHEEL STEER LOADERS AND ATTACHMENTS

SAFE OPERATION IS THE OPERATOR'S RESPONSIBILITY

Carefully follow the operating and maintenance instructions in this manual.

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

The Bobcat loader has an internal combustion engine with resultant heat and exhaust. All exhaust gases can kill or cause illness so use the loader with adequate ventilation. The loader has a spark arrestor exhaust system or muffler which is required for operation in certain areas.

The dealer explains the capabilities and restrictions of the Bobcat loader and attachments 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 Operating Capacity (some have restricted lift heights) and secure fastening to the Bobcat loader. The user must check with the dealer, or Bobcat literature, to determine safe loads of materials of specified densities for the loader-attachment combination.

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

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the Bobcat loader and attachment is in safe operating condition.
- The Operation & Maintenance Manual delivered with the Bobcat loader 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 inside the cab of the loader. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat loader 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 loader. Its brief instructions are convenient to the operator. The Handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The Safety Manual delivered with the Bobcat loader gives general safety information.
- Operator Training Courses are available from your local Bobcat dealer. They provide information for safe and efficient operation of the Bobcat loader and some attachments. The courses are available in English and Spanish versions.
- Service Safety Training Courses are available from your Bobcat dealer. They provide information for safe and correct service procedures.
- See the *ADDITIONAL PUBLICATIONS* Page in this manual or your Bobcat dealer for Service and Parts Manuals, printed materials, videos, or training courses available. Also check the Bobcat web site www.bobcat.com

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



**Call Before You Dig
1-888-258-0808**

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

BEFORE OPERATING THE BOBCAT LOADER



Safety Alert Symbol

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

The Bobcat loader 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 this Manual.

SAFE OPERATION NEEDS A QUALIFIED OPERATOR *

A QUALIFIED OPERATOR MUST DO THE FOLLOWING:

• UNDERSTAND THE WRITTEN INSTRUCTIONS, RULES AND REGULATIONS

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

• HAVE TRAINING WITH ACTUAL OPERATION

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

• KNOW THE WORK CONDITIONS

- Know the weight of the materials being handled. Avoid exceeding the Rated Operating 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 needs to know about excessive slopes.
- Know the location of any underground lines. Call local utilities or the TOLL FREE phone number found in the SAFETY INSTRUCTIONS Section of this manual.
- Wear tight fitting clothing. Always wear safety glasses when doing maintenance or service. Safety glasses, hearing protection or special applications kit are required for some work. See your dealer about Bobcat Safety equipment.

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



SI02-0502

FIRE PREVENTION

The machines 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 spark arrestor exhaust system (if equipped) 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.

- Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.
- The operator cab, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.
- Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part.
- Check fuel and hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Tighten or replace any parts that show leakage. Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Do not use ether or starting fluids on any engine which has glow plugs. These starting aids can cause explosion and injure you or bystanders.
- Always clean the machine, disconnect the battery, and disconnect the wiring from the electronic 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.
- Stop the engine and let it cool before adding fuel. No smoking!
- Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.
- Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrestor muffler (if equipped).
- Know where fire extinguishers and first aid kits are located and how to use them. Fire extinguishers are available from your Bobcat dealer.



MACHINE SIGNS (DECALS)

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

RATED OPERATING CAPACITY
996 kg 2200 lbs.

FAHRBARE NUTZLAST
CAPACIDAD DE OPERACIÓN
CAPACITÉ MAXIMUM DE LEVAGE

6730084

To bypass lift lock valve and lower lift arms

1. Turn knob 1/4 turn clockwise
2. Pull & hold knob to lower lift arms

OPERATION INSTRUCTIONS FOR ALL WHEEL STEER LOADERS (AWS)

TO OPERATE LOADER

1. Position seat belt and driver-side bar
2. Put hand controls in neutral
3. Start engine
4. Select operating mode, or control operator's panel
5. Activate power **PRESS TO OPERATE LOADER** button on left instrument panel
6. Lift or raise right or left instrument panel should be off
7. Right-side location of operator's seat is right. Check that both hand controls are in the proper position. The left engine

NOTE: Activate **PRESS TO OPERATE LOADER** button again if seat belt is released and lowered or key is turned off.

See Operation & Maintenance Manual and Handbook for more instructions.

6730210

6711840

WARNING
AVOID INJURY OR DEATH

TO LEAVE THE LOADER:

1. Lower lift arms
2. Turn key clockwise
3. Turn off engine
4. Turn off lights
5. Turn off PTO
6. Turn off hydraulic pump
7. Turn off PTO
8. Turn off PTO
9. Turn off PTO
10. Turn off PTO
11. Turn off PTO
12. Turn off PTO

6730212

6901391

WARNING
ACCIDENTAL LARGER MOVEMENT CAN CAUSE INJURY OR DEATH.

The direction the loader turns when moving forward is different in each steering mode. Always use appropriate PTO selected steering mode before operating.

6730921

WARNING

6715944

6565990

TRAC/PTO	CLUTCH/PTO	FRT & REAR	SWITCH	IGNITION
PS 30A	PS 30A	MARKER LT	POWER	PS 30A
PS 30A	PS 30A			PS 30A

6718774
Inside Fuse Cover

DANGER
AVOID DEATH

- Attachment can be forced against the ground and cause front wheels to raise.
- Never go under or reach under lift arms or lift cylinder without an approved lift arm stop installed.

6702301

FULLY ENGAGE LOCKING LEVERS
EMBARQUE COMPLETAMENTE LAS PALANCAS

6561383
Behind Bob-Tach

WARNING
CYLINDER CONTAINS HIGH PRESSURE GAS. DO NOT OPEN. OPENING CYLINDER CAN RELEASE ROD AND CAUSE INJURY OR DEATH.

6577754 (2)

WARNING
AVOID INJURY OR DEATH
CARRY LOAD LOW
FAILURE TO OBEY CAN CAUSE TIPPING OR ROLLOVER OR LOSS OF LOAD OR VISIBILITY.

6579528
Behind Lift Arm Crossmember

WARNING

AVOID INJURY OR DEATH

- Never carry riders.
- Never use loader as a man lift or work platform.

6710358

DANGER
AVOID DEATH

- Keep out of this area when lift arms are raised unless supported by lift arm stop.
- Moving lift arm control or failure of a part can cause lift arms to drop.

6702302

B-15987

xiv A220 Bobcat Loader Operation & Maintenance Manual

MACHINE SIGNS (DECALS) (Cont'd)

IMPORTANT
863/864/873/883/A220
 THIS MODEL LOADER IS FACTORY EQUIPPED WITH A SPARK ARRESTER SERVICE PROVIDED FOR SPARK ARRESTER FOR THE SYSTEM.
 THE TURBOCHARGER MUST OPERATE TO KEEP THE SPARK ARRESTER SERVICE SYSTEM IN WORKING CONDITION.
 IF THE ENGINE POWER REDUCES DUE TO A LOW OIL LEVEL, CHECK THE OIL LEVEL IMMEDIATELY. IF THE OIL LEVEL IS LOW, ADD OIL TO THE OIL TANK IMMEDIATELY. FAILURE TO DO SO MAY CAUSE SEVERE ENGINE DAMAGE.
 REFER TO LOCAL LAWS AND REGULATIONS FOR SPARK ARRESTER REQUIREMENTS.
 SEE THE OPERATION AND MAINTENANCE MANUAL FOR MORE INSTRUCTIONS.
 SW97 6708937

6708937

← PUSH TO RELEASE STOP
 6578368

6578368

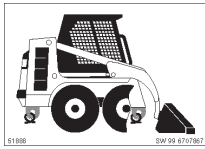
TO DISCONNECT LEAF SPRING SERVICE

1. Lower the loader to the ground.
2. Turn the engine off and wait 3 minutes.
3. Remove the 2 bolts and the cover of the leaf spring service.
4. Turn the engine on and wait 3 minutes.
5. Turn the engine off and wait 3 minutes.
6. Turn the engine on and wait 3 minutes.
7. Turn the engine off and wait 3 minutes.
8. Turn the engine on and wait 3 minutes.
9. Turn the engine off and wait 3 minutes.
10. Turn the engine on and wait 3 minutes.

TO RECONNECT LEAF SPRING SERVICE

1. Turn the engine on and wait 3 minutes.
2. Turn the engine off and wait 3 minutes.
3. Turn the engine on and wait 3 minutes.
4. Turn the engine off and wait 3 minutes.
5. Turn the engine on and wait 3 minutes.
6. Turn the engine off and wait 3 minutes.
7. Turn the engine on and wait 3 minutes.
8. Turn the engine off and wait 3 minutes.
9. Turn the engine on and wait 3 minutes.
10. Turn the engine off and wait 3 minutes.

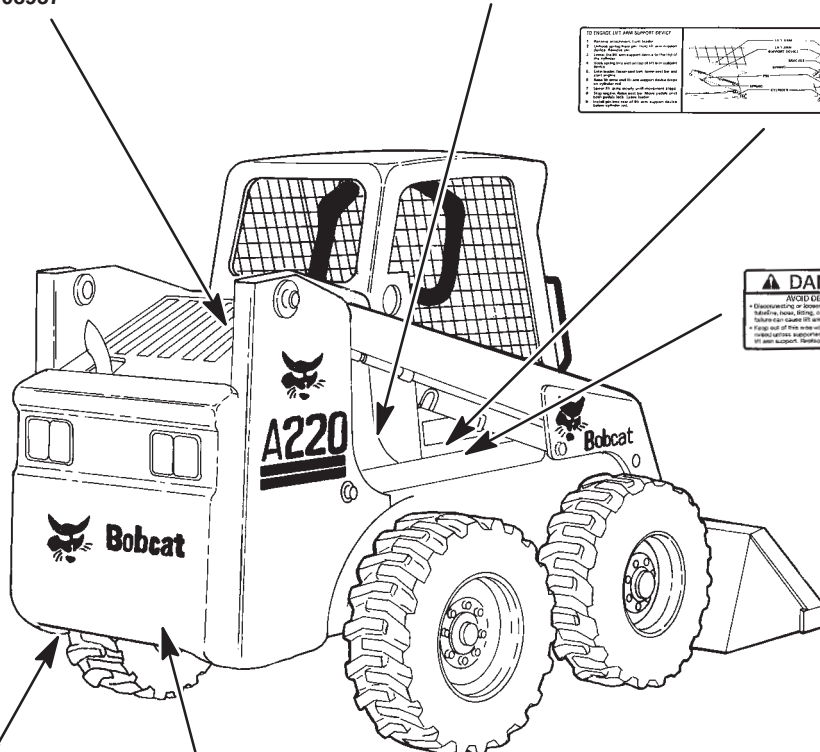
6706558



6707867

⚠ DANGER
AVOID DEATH
 • Entanglement or squeezing by hydraulic cylinders, hoses, fittings, components or pins failure can cause 3rd degree burns.
 • A large coil of hose can whip in the air.
 • Do not touch any hydraulic lines or components unless you are properly trained.
 • Do not touch any hydraulic components unless you are properly trained.
 • Do not touch any hydraulic components unless you are properly trained.
 • Do not touch any hydraulic components unless you are properly trained.

6717343 (2)
 Under Cab



⚠ WARNING
 AVOID INJURY OR DEATH
 • Avoid overloading the loader.
 • Do not lift or carry loads that are not rated for the loader.
 • Do not lift or carry loads that are not rated for the loader.
 • Do not lift or carry loads that are not rated for the loader.
 • Do not lift or carry loads that are not rated for the loader.
 • Do not lift or carry loads that are not rated for the loader.

SERVICE SCHEDULE
 Table with columns for hours of operation and maintenance tasks.

SERVICE PARTS CHART
 Table with columns for part numbers and descriptions.

6718398

⚠ WARNING
AVOID INJURY
 • Engine may have rotating parts.
 • Keep cover in place.
 • See service repair for more instructions.

6708941

Inside Rear Door



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