

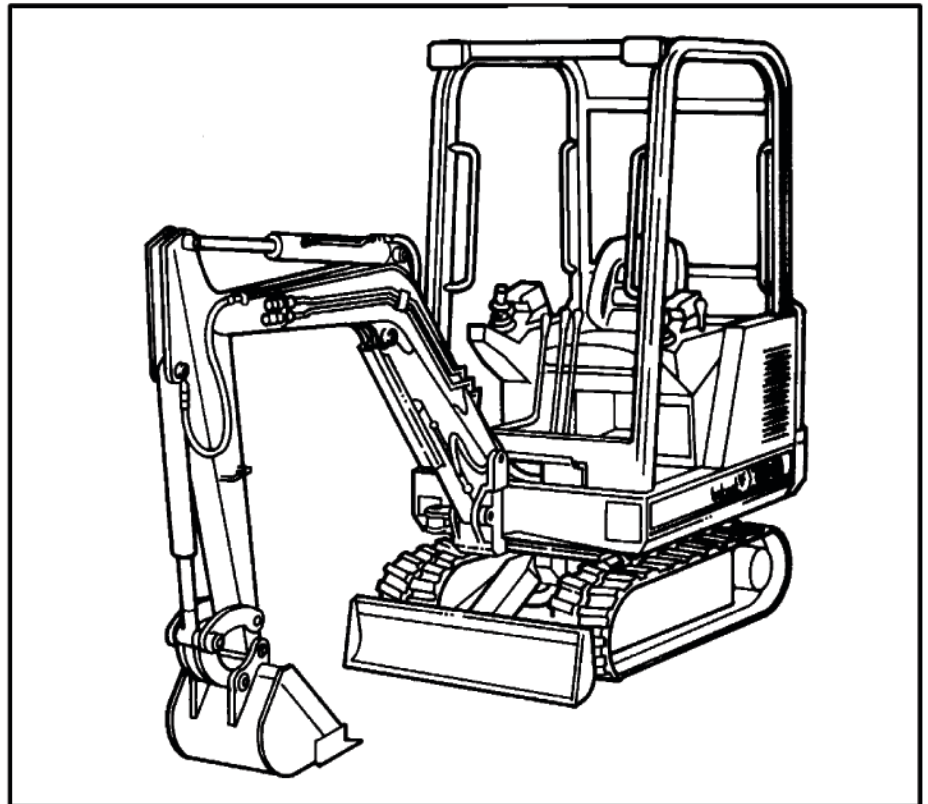
322

Excavator Operation & Maintenance Manual

322 (S/N 517811001 & Above)



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BOBCAT
INGERSOLL-RAND

6900806 (2-00) Revised (9-12)

Printed in U.S.A.



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OPERATOR SAFETY WARNINGS

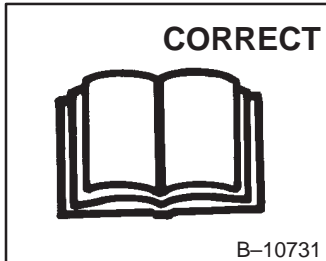


WARNING

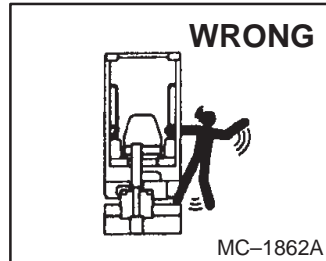
Operator must have instructions before running the machine. Untrained operators can cause injury or death.

W-2001-1285

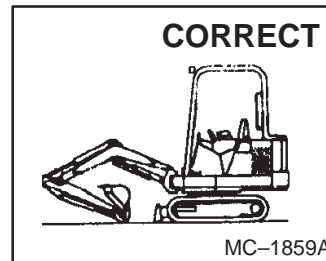
! Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



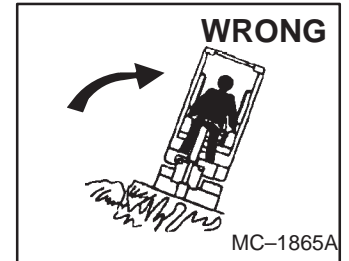
! Never operate without instructions. Read machine signs and Operation & Maintenance Manual.



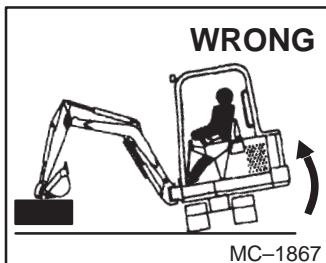
! Do not grasp control handles when entering canopy or cab.
! Be sure controls are in neutral before starting.
! Sound horn and check behind machine before starting.



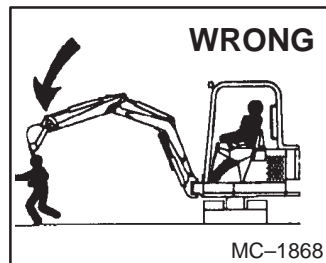
! Never operate without approved canopy or cab.
! Never modify equipment.
! Never use attachments not approved by Bobcat.



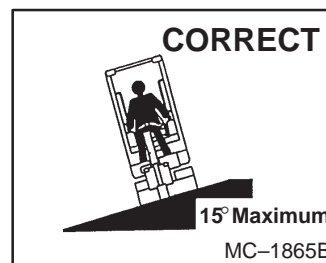
! Avoid steep areas or banks that could break away.



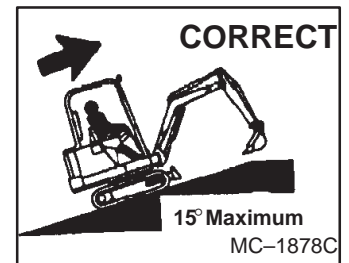
! Use caution to avoid tipping—do not swing heavy load over side of track.
! Operate on flat, level ground.



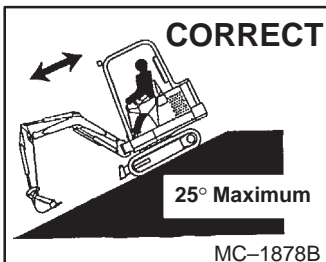
! Keep bystanders out of maximum reach area.
! Do not travel or turn with bucket extended.
! Never carry riders.



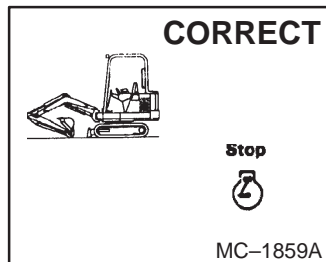
! Never exceed a 15° slope to the side.



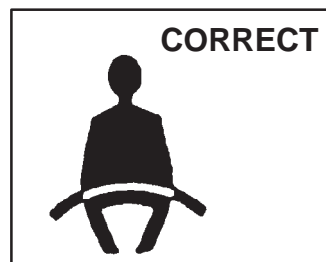
! Never travel up a slope that exceeds 15°.



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



! To leave Excavator, lower the attachment.
! Stop the engine.



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

SAFETY EQUIPMENT

1. Seat Belt
2. Swing Lock
3. ROPS/TOPS Canopy or Cab
4. Machine Safety Signs
5. Safety Tread
6. Grab Handles



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FOREWORD

SAFETY

**OPERATING
INSTRUCTIONS**

**PREVENTIVE
MAINTENANCE**

**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 Hydraulic Excavator in the spaces below. Always use these numbers when referring to your Hydraulic Excavator.

Bobcat Hydraulic Excavator
Serial Number _____
Engine Serial Number _____

NOTES: _____

YOUR BOBCAT EXCAVATOR DEALER: _____
ADDRESS: _____
PHONE: _____

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

Bobcat Europe
J. Huysmanslaan 59
B-1651 LOT
BELGIUM



Bobcat is ISO 9001 certified

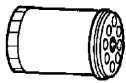
ISO 9001 is a set of international standards that control the processes and procedures which we use to design, develop, manufacture, distribute, and service Bobcat products.

British Standards Institute (BSI) is the Certified Registrar Bobcat chose to assess the Company's compliance with the ISO 9001 set of standards. The BSI registration certifies that the two Bobcat manufacturing plants and the Bobcat corporate offices (Gwinner, Bismarck & Fargo) in North Dakota are in compliance with ISO 9001. Only certified assessors, like BSI, can grant registrations. Since registration requires this *third-party auditing*, it is irrefutable evidence of conformance. Continued certification is subject to periodic audits.

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.

What does ISO 9001 mean to Bobcat Customers? It means that Bobcat produces your Bobcat loader, Excavator and attachments with strict attention to details, using the latest technology and proven techniques.

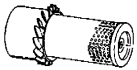
REGULAR MAINTENANCE ITEMS



3974113 ENGINE OIL FILTER



6667352 FUEL FILTER



897064 AIR CLEANER

6646545 RADIATOR CAP



6653336 HYDRAULIC FILTER



6670251 BATTERY



6724094 PROPYLENE GLYCOL ANTI-FREEZE, Premixed – [–34°F (–37°C)]

6724354 PROPYLENE GLYCOL ANTI-FREEZE, Concentrate

6563328 BLACK GOLD Hydraulic/Hydrostatic Fluid – 5 Gallons

6657299 MOTOR OIL 15W40 CE/SG – 1 Qt.

6724558 MOTOR OIL 15W40 CE/SG – 1 Gal.

6657301 MOTOR OIL 10W30 CE/SG – 1 Qt.

6724557 MOTOR OIL 10W30 CE/SG – 1 Gal.

6657303 MOTOR OIL 30 CE/SG – 1 Qt.

6724559 MOTOR OIL 30 CE/SG – 1 Gal.

FOREWORD

FOREWORD

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

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

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

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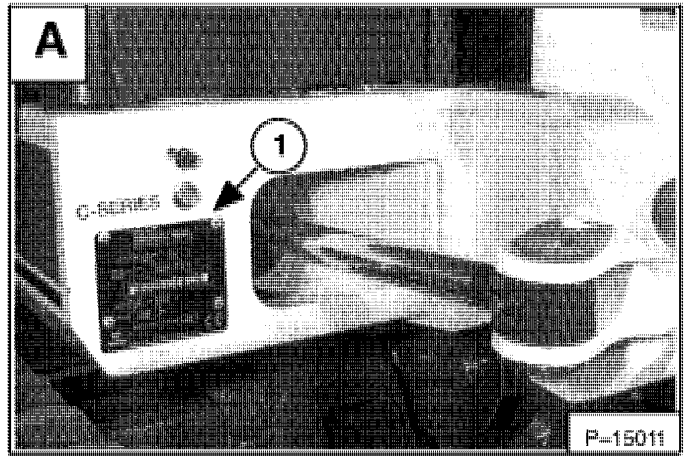


SERIAL NUMBER LOCATIONS

Always use the FULL serial number (including the first four digits) when requesting service 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.

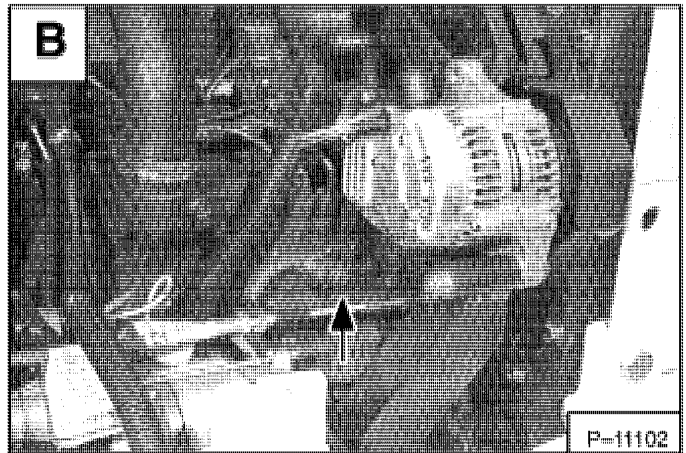
HYDRAULIC EXCAVATOR SERIAL NUMBER

The excavator serial number is on the front of the machine frame, to the right of the boom [A].



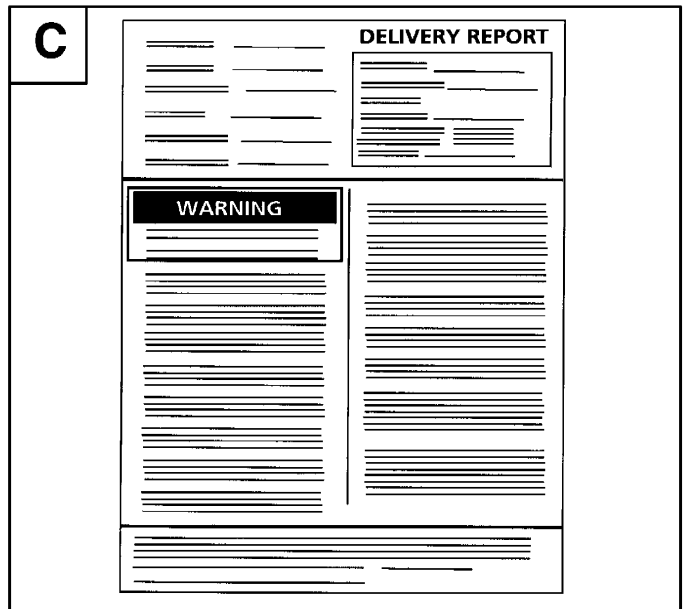
ENGINE SERIAL NUMBER

The engine serial number is located on the engine block, by the fuel injection pump [B].

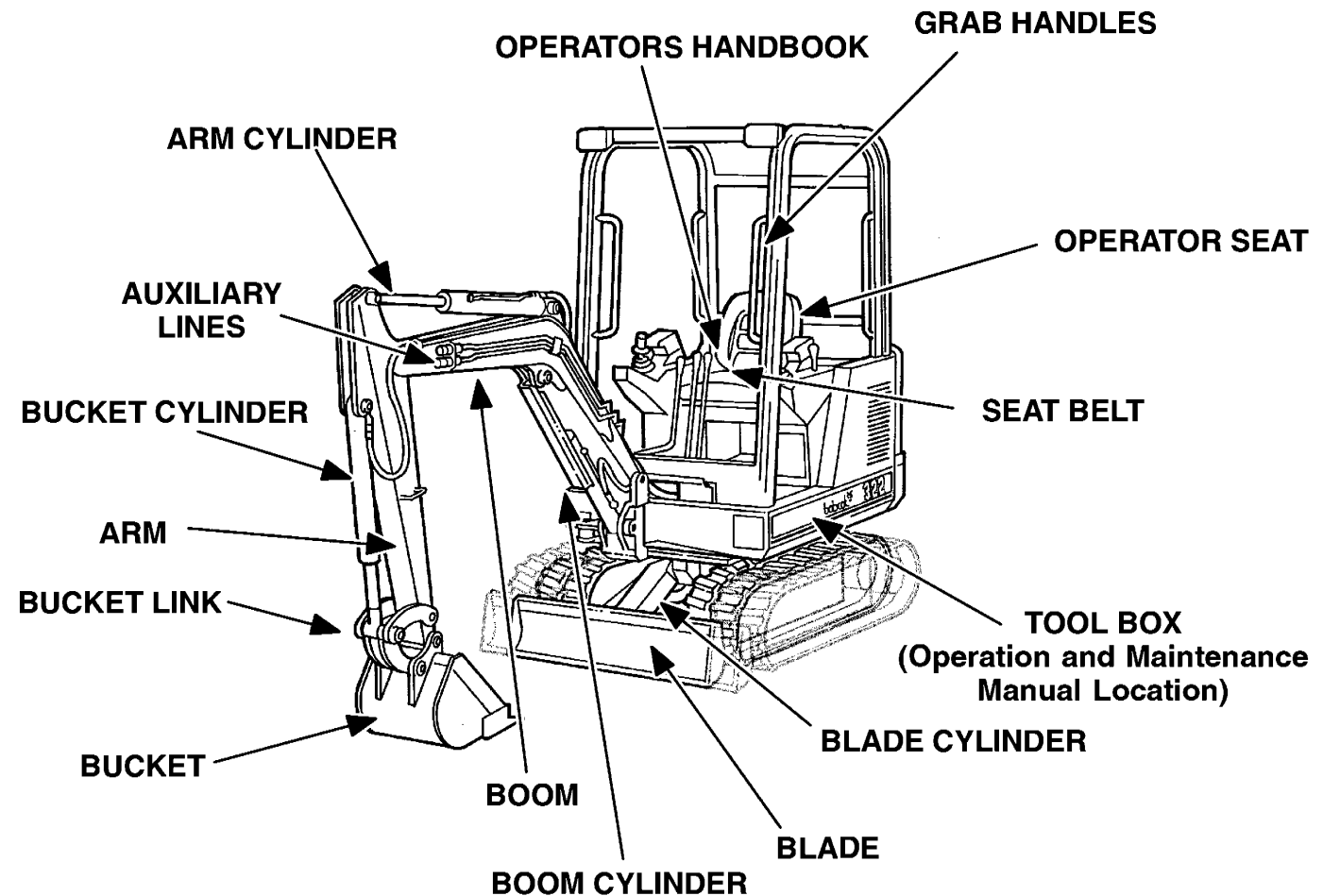
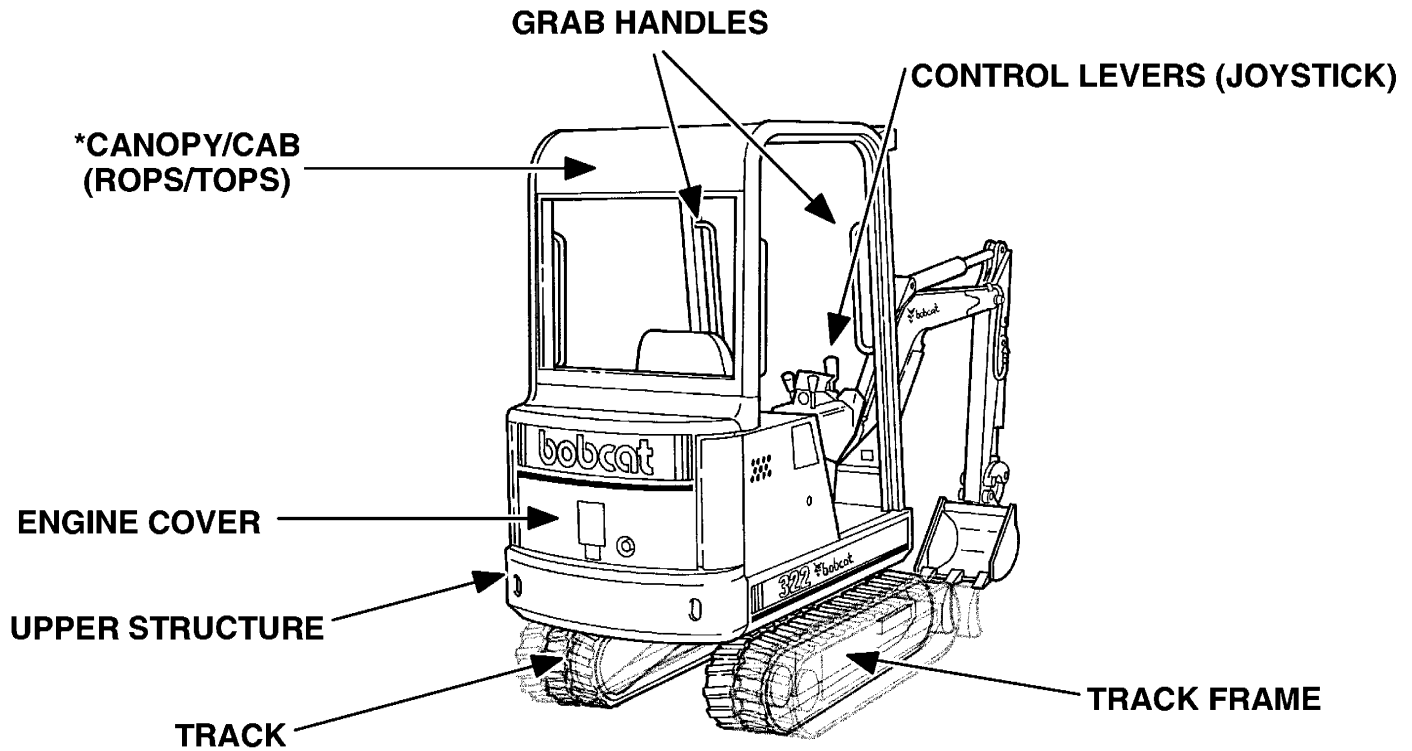


DELIVERY REPORT

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

A black and white image of a "DELIVERY REPORT" form. The form is divided into several sections. At the top right, it is titled "DELIVERY REPORT". Below the title, there are several lines of text for the dealer to fill out. On the left side, there is a section titled "WARNING" with a dark background and white text. Below this, there are several lines of text for the owner/operator to fill out. At the bottom of the form, there are several lines of text for the dealer to fill out. The label "P-11102" is in the bottom right corner.

HYDRAULIC EXCAVATOR IDENTIFICATION



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

B-14408
B-14407

SAFETY

SAFETY INSTRUCTIONS ix, x
FIRE PREVENTION xii
MACHINE SIGNS (DECALS) xii, xiii





SAFETY INSTRUCTIONS

SAFETY IS THE OPERATOR'S RESPONSIBILITY

The Bobcat Hydraulic Excavator is a highly maneuverable and compact machine. In operation, it is rugged and useful under a wide variety of conditions. This presents an operator with hazards which are common for off highway, rough terrain applications but not unique for use of Bobcat Hydraulic Excavator. The excavator has an internal combustion engine with resultant heat and exhaust. All exhaust gases can kill or cause illness so the excavator must be used with adequate ventilation. The excavator must not be used in an area with explosive dusts or gases or so that the engine exhaust can contact flammable material. Some excavators maybe equipped with a spark arrestor muffler which is required for operation in certain areas.

The dealer recommends the capabilities of the excavator and attachments for each application. The dealer demonstrates the safe operation of the excavator according to the manufacturer's instructional materials which are also available to all operators. The dealer can also identify unsafe modifications or use of unapproved attachments. The attachments and buckets are designed for rated capacity and secure fastening to the Bobcat Hydraulic Excavator. The user must check with the dealer or Bobcat literature or load diagram to identify safe loads.

The following publications provide information on the safe use and maintenance of the excavator and attachments:

- The Delivery Report is used to check whether complete instructions have been given to the new owner and that the machine is in safe operating condition.
- The Operation & Maintenance Manual delivered with the Bobcat Hydraulic Excavator gives operating information as well as routine maintenance information. It is a part of the machine and must stay with the machine when it is sold. Replacement Operation & Maintenance Manuals can be purchased from your dealer.
- Every Bobcat Hydraulic Excavator has machine signs (or decals) which instruct on the safe care and operation. The signs and their location are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat Hydraulic Excavator dealer.
- The Bobcat Hydraulic Excavator has a plastic Operator's Handbook fastened to the operator cab. It's brief instructions are convenient to the operator. The handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The CIMA safety manual contains information for safe operation and maintenance.
- The Service Manual and Parts Manual are optional manuals available from your Bobcat Hydraulic Excavator dealer for use by mechanics to do shop-type service and repair.
- The Bobcat Compact Excavator Operator Training Course is available through your local dealer. This course is intended to provide rules and practices of correct operation of the Hydraulic Excavator (also available in Spanish).
- The Service Safety Training Course is available from your Bobcat dealer. This course provides information for safe and correct service procedures for Bobcat Hydraulic Excavator.
- The Bobcat Hydraulic Excavator Safety Video is available from your Bobcat Dealer.

The dealer and owner/operator review the recommended uses of the excavator and attachments when excavator is delivered. If the owner/operator will be using the excavator for a different application than was originally demonstrated by the dealer, 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.).

SI22-0100

BEFORE OPERATING THE BOBCAT HYDRAULIC EXCAVATOR

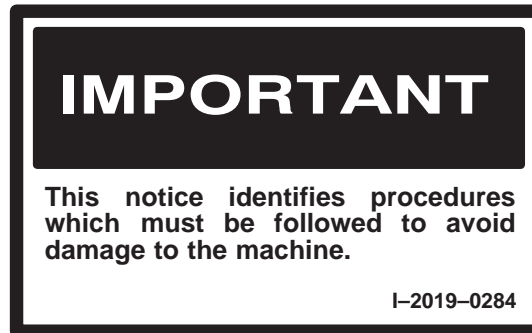


Safety Alert Symbol: This symbol with a warning statement, means: “Warning, be alert! Your safety is involved!” Carefully read the message that follows.



B-10731

The Excavator must be in good operating condition before use. Check all of the items on the Service Schedule 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 include the Delivery Report, Operation & Maintenance Manual, Operator Handbook, 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 Slow Moving Vehicle 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 excavator dealer before the excavator is delivered.
 - The new operator should start in an area without bystanders and use all the controls until he can operate safely under all conditions of the work area.
 - The Compact Excavator Operator Training Course is available in English and Spanish. The course provides information for safe and efficient operation. See your dealer for availability.
 - The Service Safety Training Course is available from your Bobcat dealer. This course provides information for safe and correct service procedures for Bobcat Hydraulic Excavator.
- KNOW THE WORK CONDITIONS
 - For each material to be handled, the operator must know how to avoid exceeding the rated lift capacity of the excavator. For example, you should not use the excavator for lifting heavy objects.
 - 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 maintaining or servicing excavator. Safety glasses, hearing protection or an excavator special application kit are required for some work. See your dealer about Melroe Safety equipment.

* For an operator 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.

SI23-0100

FIRE PREVENTION

The excavator has several components that are at high temperature 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. These conditions make it important to avoid applications where explosive dust or gases can be ignited by arcs, sparks or heat.

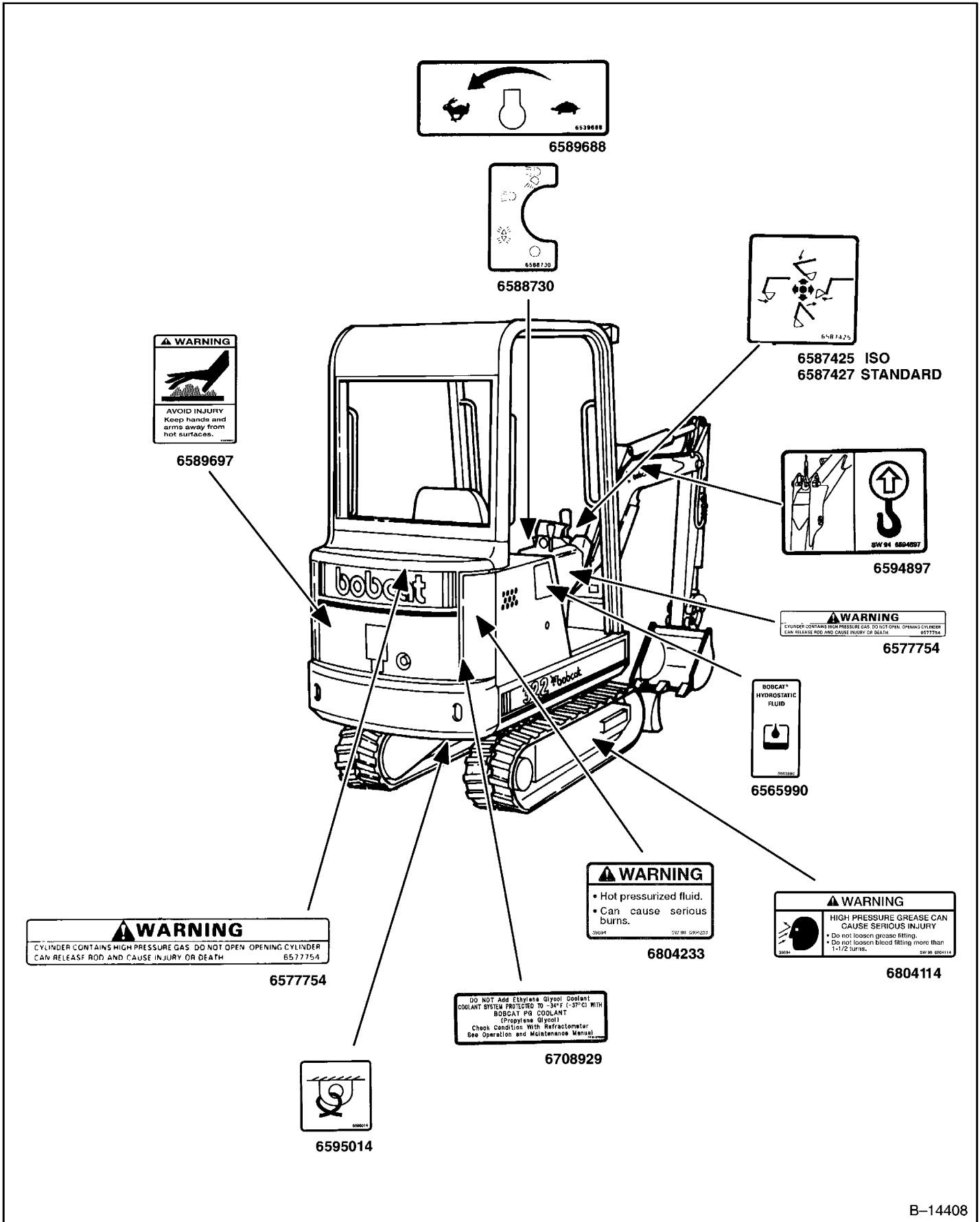
Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it will increase the fire hazard. The excavator must be cleaned as often as necessary to avoid this accumulation. This flammable debris in the engine compartment can be a fire hazard when the machine is parked with a hot engine.

If equipped the spark arrestor muffler 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. This spark arrestor muffler does not change the need to avoid use of the excavator in an atmosphere with explosive dust or gases or where the exhaust can contact flammable material.

- Do not use the Hydraulic Excavator where explosive dust or gases can be ignited by arcs, sparks, hot components or exhaust gases.
- The operator cab, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent overheating. Remove all flammable material.
- 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. Tighten or replace any parts that show leakage. Always clean fluid spills.
- Do not use ether or starting fluids on any engine which has glow plugs. These starting aids can explode and injure bystanders.
- Always clean the excavator before doing any welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the machine when welding.
- Stop the engine and let it cool before adding fuel. No smoking!
- Use the procedure in Operation & Maintenance Manual for connecting the battery.
- Use the procedure in the Operation & Maintenance Manual for servicing the spark arrestor muffler (if equipped) every 100 hours of operation.
- Know where fire extinguishers and first aid kits are located and how to use them. A fire extinguisher is available from your Bobcat Dealer.

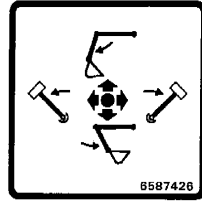
MACHINE SIGNS (DECALS)

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. Replacement machine signs are available from your Bobcat Excavator dealer.

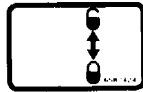


B-14408

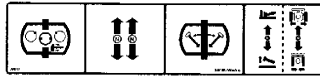
MACHINE SIGNS (DECALS) (Cont'd)



6587426 ISO
6587428 STANDARD



6587424



6805305

WARNING EXCAVATOR MODEL 322

OPERATOR'S MANUAL	OPERATOR'S MANUAL	OPERATOR'S MANUAL	OPERATOR'S MANUAL	OPERATOR'S MANUAL	OPERATOR'S MANUAL
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48
49	50	51	52	53	54
55	56	57	58	59	60

6805954

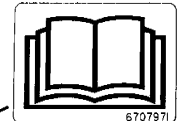
WARNING
AVOID INJURY OR DEATH

TO READ THE OPERATOR'S MANUAL	TO READ THE OPERATOR'S MANUAL	TO READ THE OPERATOR'S MANUAL	TO READ THE OPERATOR'S MANUAL	TO READ THE OPERATOR'S MANUAL
1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41	42	43	44	45
46	47	48	49	50
51	52	53	54	55
56	57	58	59	60

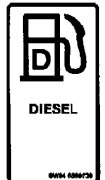
6804230

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

6577754



6707971



6589739

WARNING
Intricate loading, lifting, unloading and fitting procedures can cause back or injury or death.

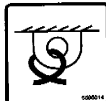
TRANSPORTING MACHINE	LIFTING MACHINE
1. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.	1. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.
2. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.	2. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.
3. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.	3. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.
4. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.	4. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.
5. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.	5. Do not use the machine to lift or transport loads unless the operator is specifically trained and authorized to do so.

6804231

KEY SWITCH PREHEAT POSITION	AIR TEMP.	PREHEAT TIME (SECONDS)
	41°F (5°C) and Above	0 - 10
	32° to 41°F (0° to 5°C)	10
	32°F (0°C) and Below	10 - 30

SEE OPERATOR'S MANUAL FOR MORE INSTRUCTIONS.
WEITERE INSTRUKTIONEN FINDEN SIE IN DER BEDIENUNGSANLEITUNG.
CONSULTA EL MANUAL DEL OPERADOR PARA MAS INSTRUCCIONES.
SE REPORTE AU MANUAL DEL OPERATEUR POUR PLUS D'ENSEIGNEMENT.

6589058

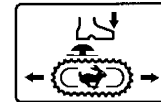


6595014

SERVICE SCHEDULE
(See operator's Manual for instructions & Specifications)

<p>EVERY 8-10 HOURS</p> <ol style="list-style-type: none"> 1. Check engine coolant level. 2. Check engine oil level. 3. Check hydraulic fluid level. 4. Check air cleaner. 5. Check & adjust track tension. 6. Check indicator lights for correct operation. 7. Check cable condition & mounting hardware. 8. Check wear belt condition & mounting hardware. 9. Check for damaged signs (decals). Replace as needed. 10. Grease all machinery pivot points (if applicable). 	
<p>EVERY 50 HOURS</p> <ol style="list-style-type: none"> 11. Grasp swing pinion & swing circle (2 at a time). 12. Check water & sediment from fan belt & belt filter. 13. Check condition of fan belt (at first 50 hours). 14. Check battery voltage and electrolyte level. 	
<p>EVERY 100 HOURS</p> <ol style="list-style-type: none"> 15. Replace engine oil and filter. 16. Check & set air filter of requirement. 17. Clean spark chamber of Spark Arrestor (if so equipped). 18. Replace hydraulic filter (at first 100 hours). 19. Replace oil in both final drive (at first 100 hours). 20. Replace core main hydraulic filter (at first 100 hours). 	
<p>EVERY 200 HOURS</p> <ol style="list-style-type: none"> 21. Replace diesel fuel filter. 22. Check oil level in both final drive cases. 	
<p>EVERY 500 HOURS</p> <ol style="list-style-type: none"> 23. Clean radiator fins. 24. Replace hydraulic filter. 25. Replace air cleaner element. 26. Check alternator & starter operations. 27. Check & adjust engine valve clearance. 28. Replace core main hydraulic filter. 	
<p>EVERY 1000 HOURS or EVERY 6 MONTHS</p> <ol style="list-style-type: none"> 29. Replace oil in both final drive cases. 30. Drain & flush cooling system - Replace coolant. 31. Replace hydraulic fluid & filter - Clean reservoir. 	

6805828



6801914

WARNING
HIGH PRESSURE GREASE CAN CAUSE SERIOUS INJURY

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

6804114



OPERATING INSTRUCTIONS

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