

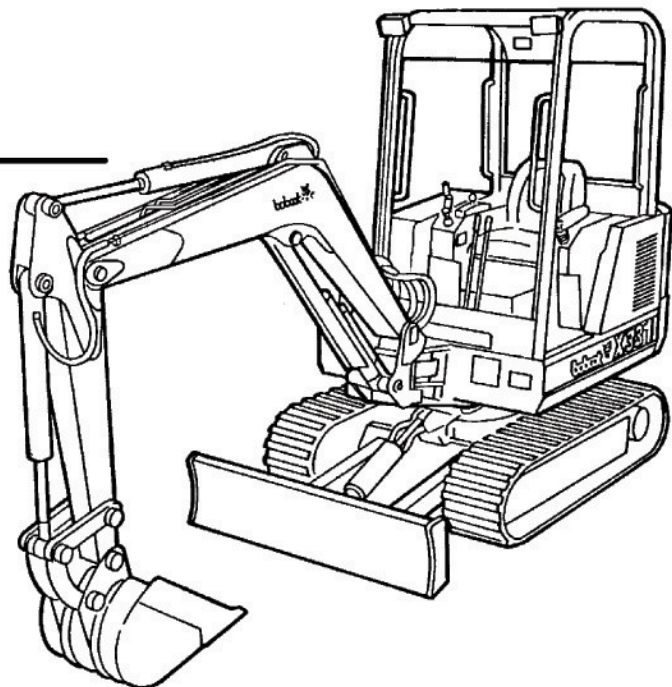
X 331
X 331E
X 334



Bobcat®

Operation & Maintenance Manual

S/N 512915200 & Above
S/N 517711001 & Above
S/N 516711001 & Above



Doosan purchased Bobcat Company from Ingersoll-Rand Company in 2007. Any reference to Ingersoll-Rand Company or use of trademarks, service marks, logos, or other proprietary identifying marks belonging to Ingersoll-Rand Company in this manual is historical or nominative in nature, and is not meant to suggest a current affiliation between Ingersoll-Rand Company and Bobcat Company or the products of either.

IR Bobcat®
Printed in U.S.A.

OPERATOR SAFETY WARNINGS

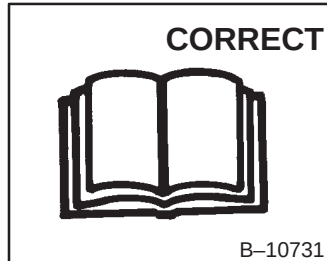


WARNING

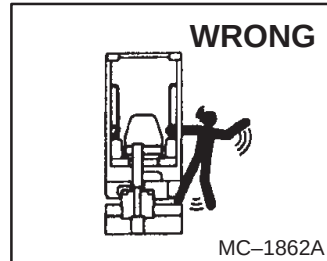
Operator must have instructions before running the machine. Untrained operators can cause injury or death.

W-2001-1285

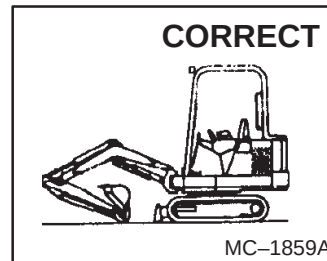
! Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



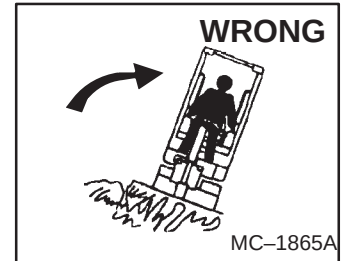
! Never operate without instructions. Read machine signs and Operation & Maintenance Manual.



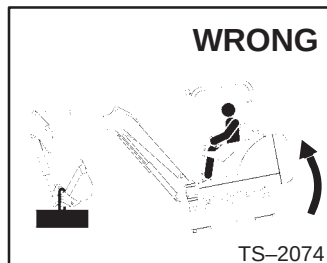
! Do not grasp control handles when entering canopy or cab.
! Be sure controls are in neutral before starting.
! Sound horn and check behind machine before starting.



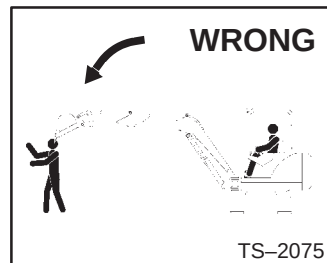
! Never operate without approved canopy or cab.
! Never modify equipment.
! Never use attachments not approved by Bobcat Company.



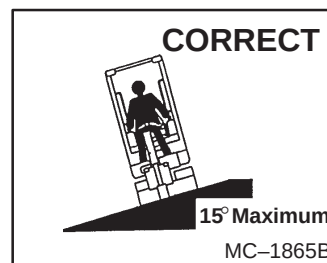
! Avoid steep areas or banks that could break away.



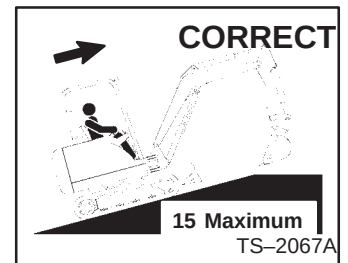
! Use caution to avoid tipping—do not swing heavy load over side of track.
! Operate on flat, level ground.



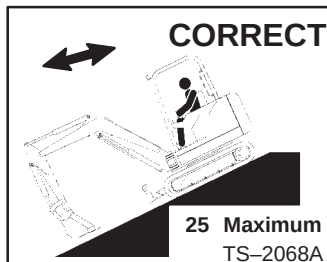
! Keep bystanders out of maximum reach area.
! Do not travel or turn with bucket extended.
! Never carry riders.



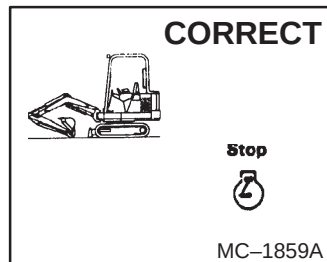
! Never exceed a 15° slope to the side.



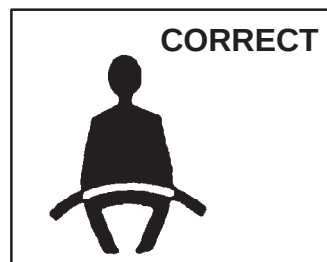
! Never travel up a slope that exceeds 15°.



! 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



FOREWORD	iii
SAFETY INSTRUCTIONS	vii
OPERATING INSTRUCTIONS	1
PREVENTIVE MAINTENANCE	37
MACHINE SIGN TRANSLATIONS	63
SPECIFICATIONS	81

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

Bobcat Company Europe
J. Huysmanslaan 59
B-1651 LOT
BELGIUM



Bobcat Company is ISO 9001 certified

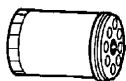
ISO 9001 is a set of international standards that control the processes and procedures which we use to design, develop, manufacture, distribute, and service Bobcat products.

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 & 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 Company produces your Bobcat loader, excavator, and attachments with strict attention to details, using the latest technology and proven techniques.

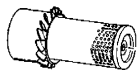
REGULAR MAINTENANCE ITEMS



3974896 ENGINE OIL FILTER



6667352 FUEL FILTER



6666333 AIR CLEANER (Primary)
6666334 AIR CLEANER (Secondary)

3974310 RADIATOR CAP



6653336 HYDRAULIC FILTER



6670251 BATTERY



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

6724354 PROPLYLENE 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 and preventive maintenance instructions 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 and extra Operation & Maintenance Manuals are also available.

SERIAL NUMBER LOCATIONS	v
DELIVERY REPORT	v
BOBCAT HYDRAULIC EXCAVATOR IDENTIFICATION	vi



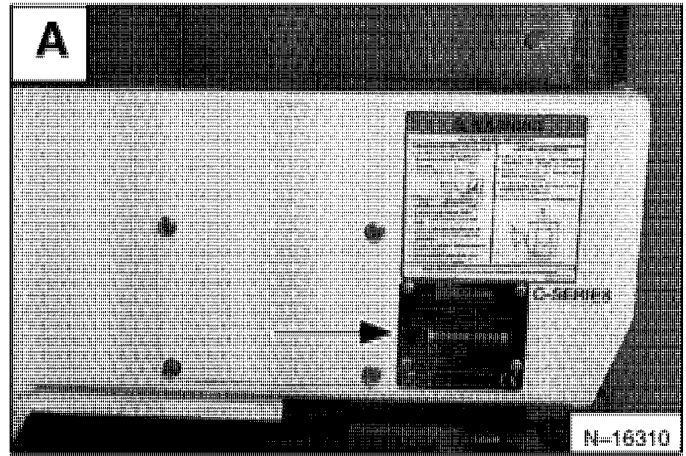
Bobcat®

SERIAL NUMBER LOCATIONS

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

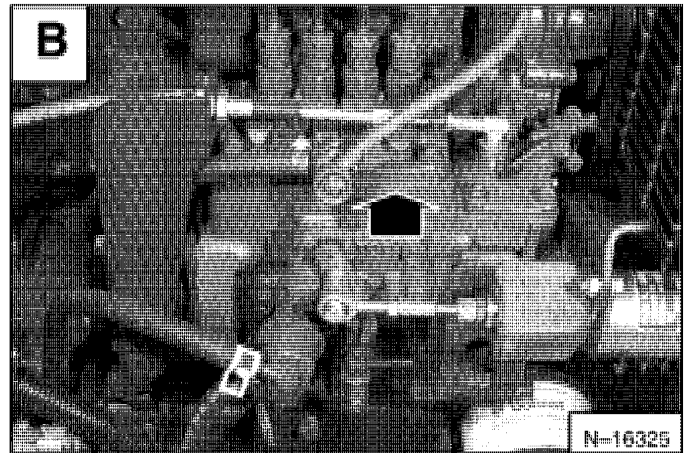
HYDRAULIC EXCAVATOR SERIAL NUMBER

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



ENGINE SERIAL NUMBER

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

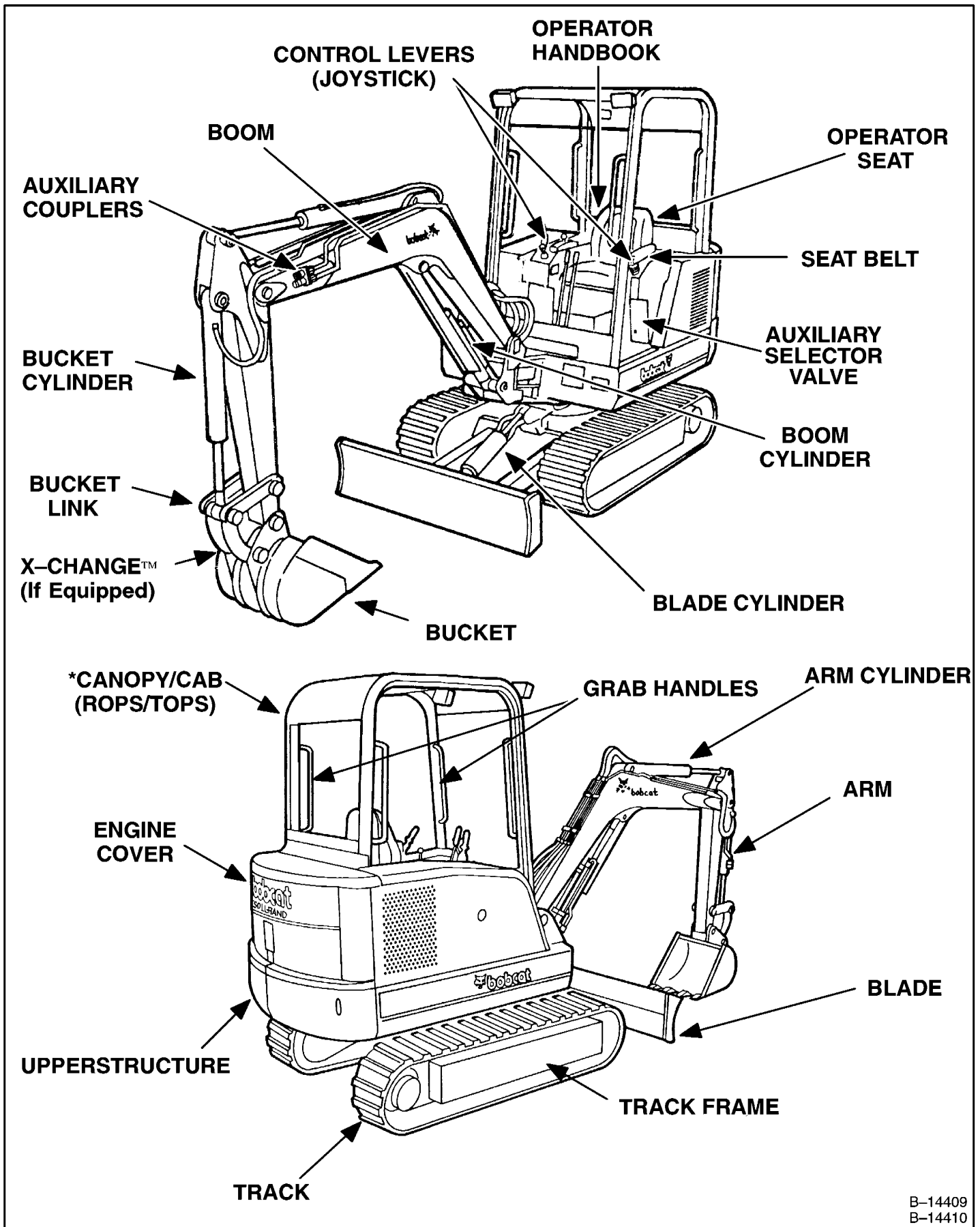


DELIVERY REPORT

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 photograph of a delivery report form. The form is titled 'DELIVERY REPORT' and contains several sections for information. The image is labeled with a large 'C' in the top left corner.

HYDRAULIC EXCAVATOR IDENTIFICATION



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

SAFETY

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

SAFETY



Bobcat®

SAFETY INSTRUCTIONS FOR BOBCAT COMPACT EXCAVATORS AND ATTACHMENTS

SAFETY IS THE OPERATOR'S RESPONSIBILITY

All Bobcat excavators and attachments are designed to give maximum safety, but no machine design can prevent operator error or carelessness.

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

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

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

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the Bobcat excavator and attachment is in safe operating condition.
- The Operation & Maintenance Manual delivered with the Bobcat excavator 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 excavator. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat excavator 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. 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 excavator 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 excavator and some attachments. The courses are available in English and Spanish versions.
- See the *ADDITIONAL PUBLICATIONS* Page in this manual or your Bobcat dealer for Service and Parts Manuals, printed material, 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.)

SI22-0400

BEFORE OPERATING THE BOBCAT COMPACT EXCAVATOR



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 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 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 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 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 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.

! WARNING

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

W-2001-1285

IMPORTANT

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

I-2019-0284

! WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W-2044-1285

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) (Cont'd)

DO NOT Add Ethylene Glycol Coolant
COOLANT SYSTEM PROTECTED TO -34°F (-37°C) WITH
BOBCAT PG COOLANT
(Propylene Glycol)
Check Condition With Refractometer
See Operation and Maintenance Manual

6708929

SERVICE SCHEDULE
(See operator's manual for instructions & recommendations)

EVERY 8-10 HOURS

1. Check engine coolant level.
2. Check engine oil level.
3. Check hydraulic fluid level.
4. Check air cleaner condition indicator.
5. Check & adjust track tension.
6. Check indicator lights for correct operation.
7. Check cable & control lever & mounting hardware.
8. Check work area conditions & mounting hardware.
9. Check for damaged signs & decals. Replace as needed.
10. Check air cleaner filter condition.
11. Apply grease to pins on extendible arm at end points.

EVERY 50 HOURS

12. Grease swing pin & swing circle (if required).
13. Drain water & sediment from fuel tank & fuel filter.
14. Replace engine oil after first 50 hours.
15. Check condition of air filter & fuel air filter.
16. Check battery cables and electrolyte level.

EVERY 100 HOURS

17. Check & adjust the fan belt if required.
18. Spark Arrestor Muffler - Clean spark chamber.
19. Replace hydraulic filter (at first 100 hours).
20. Replace oil in both final drive cases (at first 100 hours).
21. Replace case drain hydraulic filter (at first 100 hours).

EVERY 250 HOURS

22. Replace diesel fuel filter.
23. Replace case drain hydraulic filter (at first 250 hours).
24. Check oil level in both final drive cases.

EVERY 500 HOURS

25. Clean external filter.
26. Replace hydraulic filter.
27. Check generator & starter connections.
28. Check & adjust engine valve clearance.
29. Replace case drain hydraulic filter.

EVERY 1000 HOURS OR EVERY 6 MONTHS

30. Replace oil in both final drive cases.
31. Check & adjust cooling system - Replace coolant.
32. Replace hydraulic filter & filter - Clean reservoir.

6804326

WARNING
AVOID INJURY OR DEATH

1. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

2. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

3. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

4. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

5. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

6. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

7. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

8. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

9. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

10. **DO NOT RE-ENTER** the machine until the operator has been notified that it is safe to do so. The operator must be notified of the location of the person who is re-entering the machine.

6804230

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

6577754

6577754

WARNING

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

6804232

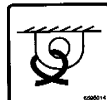
6804232

WARNING

- Hot pressurized fluid.
- Can cause serious burns.

6804233

6804233



6595014

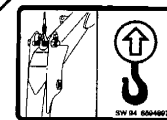
UNDERCARRIAGE COMPONENTS

This undercarriage is equipped with rollers and idlers for use with rubber tracks only.

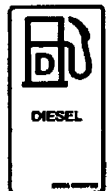
Refer to parts manual for components required for use with steel tracks.

6589129

6589129



6594897



6589739



6803760

BOBCAT® HYDROSTATIC FLUID

6566990

6566990

WARNING

HIGH PRESSURE GREASE CAN CAUSE SERIOUS INJURY

- DO NOT LOOSEN GREASE FITTING
- DO NOT LOOSEN BLEED FITTING MORE THAN 1/2 TURN.

6804114

6804114

WARNING

MELROE MODEL EXCAVATOR

THIS EXCAVATOR IS EQUIPPED WITH A HYDRAULIC SYSTEM THAT OPERATES AT PRESSURES UP TO 3,000 PSI (207 BAR). THE OPERATOR MUST BE AWARE OF THE PRESSURE LEVELS AND THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS. THE OPERATOR MUST BE AWARE OF THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS. THE OPERATOR MUST BE AWARE OF THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS.

Model	Capacity (cu yd)	Capacity (cu m)	Weight (lb)	Weight (kg)
331	1.0	0.75	10,000	4,500
331E	1.0	0.75	10,000	4,500
334	1.0	0.75	10,000	4,500
334E	1.0	0.75	10,000	4,500

6589745 (331) w/o counterweights
 6805625 (331) w/counterweights

WARNING

EXCAVATOR MODEL 331E (AND MODELS 331 OR 334) EQUIPPED WITH EXTENSIBLE ARM

THIS EXCAVATOR IS EQUIPPED WITH A HYDRAULIC SYSTEM THAT OPERATES AT PRESSURES UP TO 3,000 PSI (207 BAR). THE OPERATOR MUST BE AWARE OF THE PRESSURE LEVELS AND THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS. THE OPERATOR MUST BE AWARE OF THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS. THE OPERATOR MUST BE AWARE OF THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS.

Model	Capacity (cu yd)	Capacity (cu m)	Weight (lb)	Weight (kg)
331E	1.0	0.75	10,000	4,500
331E	1.0	0.75	10,000	4,500
334E	1.0	0.75	10,000	4,500
334E	1.0	0.75	10,000	4,500

6804687 (331E) w/extendible arm

WARNING

MELROE EXCAVATOR

THIS EXCAVATOR IS EQUIPPED WITH A HYDRAULIC SYSTEM THAT OPERATES AT PRESSURES UP TO 3,000 PSI (207 BAR). THE OPERATOR MUST BE AWARE OF THE PRESSURE LEVELS AND THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS. THE OPERATOR MUST BE AWARE OF THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS. THE OPERATOR MUST BE AWARE OF THE LOCATION OF THE HYDRAULIC LINES AND FITTINGS.

Model	Capacity (cu yd)	Capacity (cu m)	Weight (lb)	Weight (kg)
331	1.0	0.75	10,000	4,500
331E	1.0	0.75	10,000	4,500
334	1.0	0.75	10,000	4,500
334E	1.0	0.75	10,000	4,500

6804320 (334) w/o counterweights
 (331) w/long arm and w/o counterweights
 6805626 (334) w/counterweights or
 (331) w/long arm and w/counterweights

B-14410



Bobcat®

OPERATING INSTRUCTIONS

OPERATING INSTRUCTIONS

ATTACHMENTS (Pin On)	
Removal	24
Installation	24
ATTACHMENTS (Using The X-Change™ Systems)	
Removal	25
Installation	26
AUDIBLE ALARM	11
AUXILIARY POWER OUTLET	5
AUXILIARY FLOW CONTROL VALVE	
Auger And Other Attachment Operation	14
Breaker And Compactor Operation	14
AUXILIARY HYDRAULIC PEDAL	
Operation	14
Quick Couplers	13
BLADE CONTROL LEVER	20
BOOM SWING PEDAL	19
CAB/CANOPY	5
CAB/CANOPY FOGS (Falling Object Guards)	5
CAB OPTION	
Cab Door	6
Closing The Front Window	7
Emergency Exit	6
Front Window	6
Heater Control	9
Interior Light	8
Opening The Front Window	7
Windshield Washer Tank	8
Wiper Washer Switch	8
CONSOLE SWITCHES	9
CONTROL LEVER (JOYSTICK) LOCK	20
CONTROL LEVERS (JOYSTICKS)	
Operation Of Left Control Lever (ISO)	17
Operation Of Right Control Lever (ISO)	17
Operation Of Left Control Lever (Standard)	18
Operation Of Right Control Lever (Standard)	18
DAILY INSPECTION	22
DIRECT TO TANK VALVE (If Equipped)	
Auger And Other Attachment Operation	14
Breaker And Compactor Operation	14
ENGINE COVER	12
ENTERING AND EXITING THE EXCAVATOR	21

Continued On Next Page

OPERATING INSTRUCTIONS (Cont'd)

EXTENDABLE ARM	
Operation	15
FUSES	10
HORN BUTTON	11
INSTRUMENT PANEL	3
KEY SWITCH	3
LIFTING THE HYDRAULIC EXCAVATOR	35
OPERATOR'S HANDBOOK	12
OPERATING PROCEDURE	
Back Filling	30
Boom Offset	29
Driving The Excavator	30
Excavating	28
Lifting A Load	27
Operating on Public Roads	27
Operating on Slopes	31
Operating in Water	33
PARKING THE HYDRAULIC EXCAVATOR	33
SEAT	12
SPEED CONTROL LEVER	9
STARTING THE ENGINE	
Cold Temperature Starting Procedure	23
Normal Starting Procedure (With Engine Warm)	22
STEERING LEVER/FOOT PEDALS	
Forward And Reverse Travel	4
Turning	4
STORAGE COMPARTMENT	12
SWING LOCK	19
TRANSPORTING THE HYDRAULIC EXCAVATOR	34
TWO SPEED FOOT SWITCH	20

INSTRUMENT PANEL

The instrument panel has the following instruments:

PREHEAT INDICATOR LIGHT – (Item 1) **[A]** – When turning the key switch to the PREHEAT position, the light comes ON, showing the glow plugs are heating.

ENGINE CHARGING LIGHT – (Item 2) **[A]** – When the alternator output is low the light will come on.

HYDRAULIC FILTER/ FLUID LIGHT – (Item 3) **[A]** – When the hydraulic filter is plugged or the hydraulic fluid is overheated, the light comes ON and the audible alarm sounds. Stop the engine.

ENGINE OIL LIGHT – (Item 4) **[A]** – When the engine oil pressure is low, the light comes ON and audible alarm sounds. STOP the engine.

LOW FUEL INDICATOR LIGHT – (Item 5) **[A]** – When fuel level is low (approximately 2.5 gals. [9,3 L.]), the light comes ON. Add fuel.

FUEL GAUGE – (Item 6) **[A]** – Shows the amount of the fuel in the tank.

ENGINE TEMPERATURE GAUGE – (Item 7) **[A]** – Shows engine coolant temperature. Audible alarm sounds and the warning light (Item 8) **[A]** comes ON when temperature reaches 230°F. (110°C.). Stop the engine.

NOTE: To check oil pressure and hydraulic system lights, turn the key to the ON position. The hydraulic system light will turn off in 10 seconds. The oil pressure light will stay on and the warning buzzer will continue to be activated until either the key switch is turned to the off position or the engine is started.

The hourmeter (Item 1) **[B]** is located inside the engine compartment.

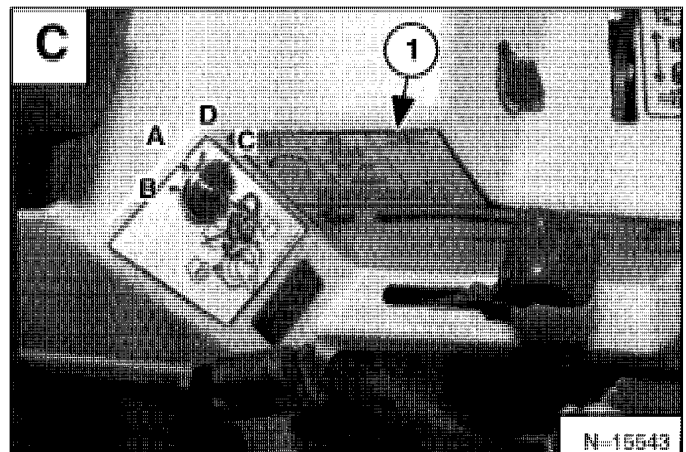
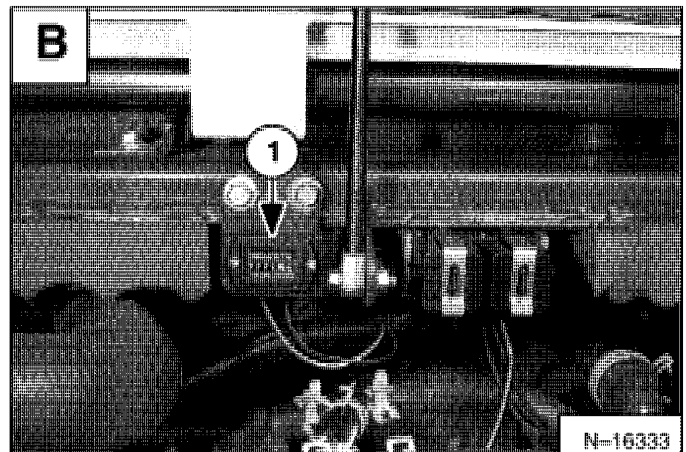
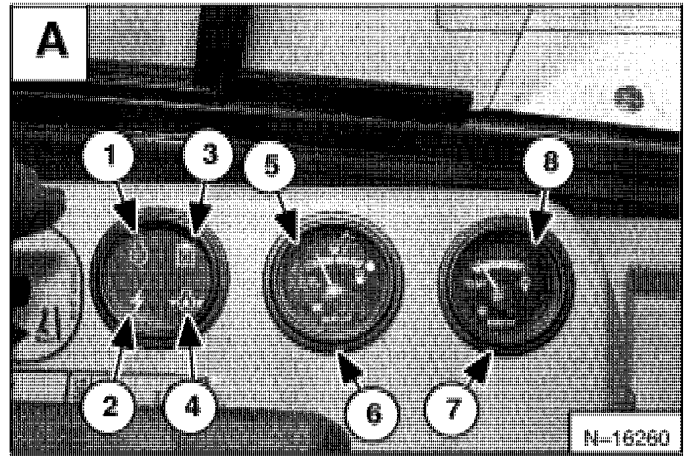
KEY SWITCH

The key switch has the following functions **[C]**:

- A. Key switch is OFF, and the engine stops
- B. PREHEAT position – Hold switch in this position to activate the glow plugs for starting in cold weather. See Decal (Item 1) **[C]** for glow plugs heating times and also Page 23.
- C. START the engine.
- D. ON (run) position – When the engine is running release the key and this position is obtained automatically. The fuel gauge and temperature gauge are illuminated when the key switch is in the on (run) position.

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

See Pages 22 and 23 for the starting procedure.



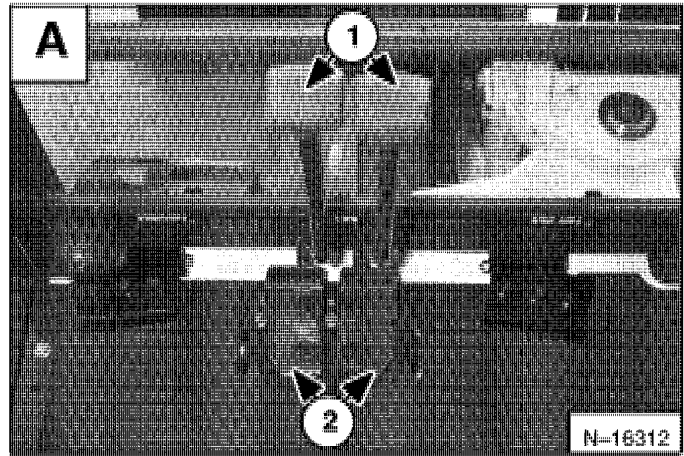
STEERING LEVERS/FOOT PEDALS

Forward And Reverse Travel

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

Put the blade so that it is at the front of the machine as you sit in the operator's seat. Slowly push both steering levers* (Item 1) [A] forward for forward travel. Pull both steering levers backward for reverse travel.

*There are also foot pedals (Item 2) [A] to operate the steering levers in the same manner.



WARNING

AVOID INJURY OR DEATH

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

W-2235-0396

Turning

Right Turn

Push the left steering lever forward to turn to the right [B] while traveling in a forward direction.

Pull the left steering lever backward to turn to the right [D] while traveling in a reverse direction.

Counter-Rotation Turn Right

Push the left steering lever forward and pull the right steering lever backward [F].

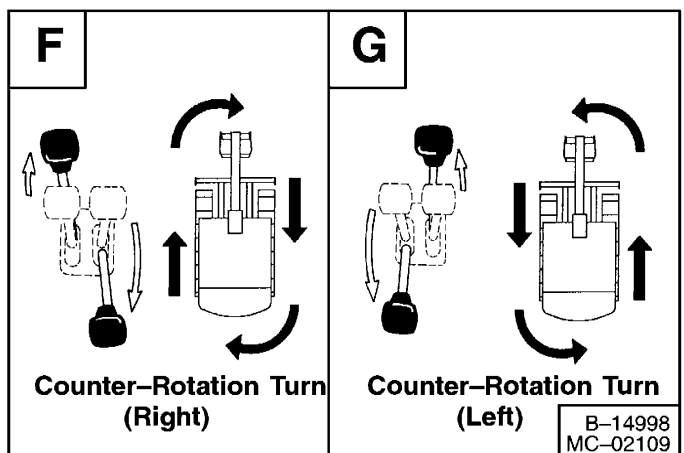
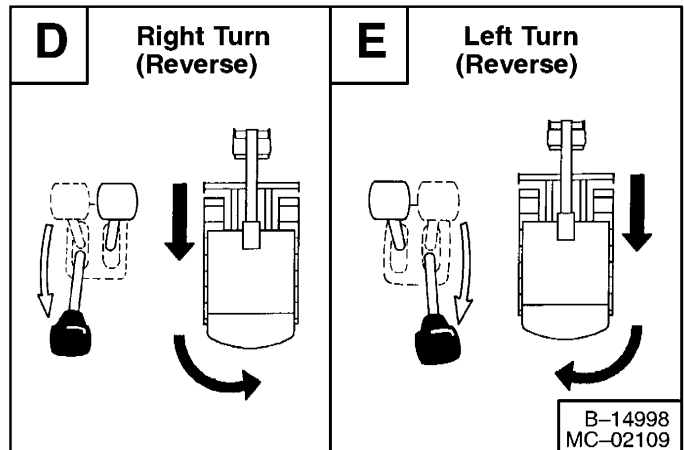
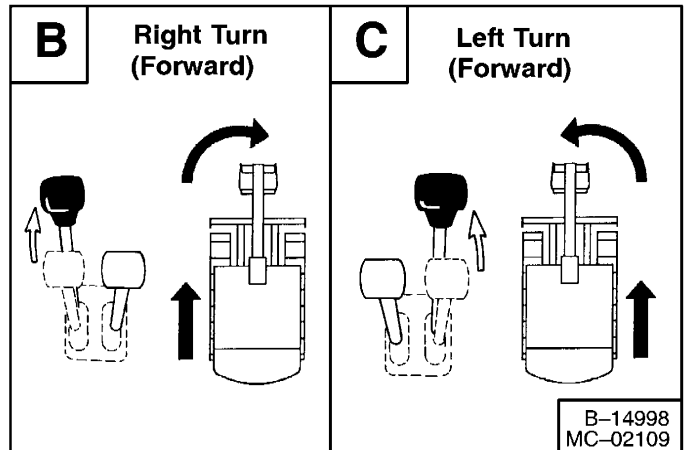
Left Turn

Push the right steering lever forward to turn to the left [C] while traveling in a forward direction.

Pull the right steering lever backward to turn to the left [E] while traveling in a reverse direction.

Counter-Rotation Turn Left

Push the right steering lever forward and pull the left steering lever backward [G].



AUXILIARY POWER OUTLET

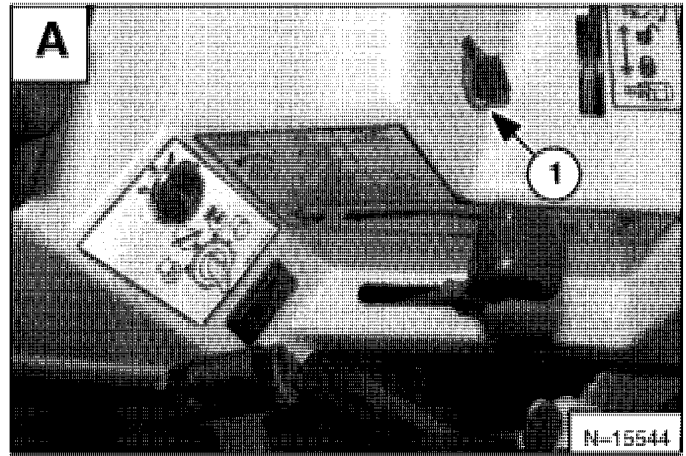
The auxiliary power outlet (Item 1) **[A]** is used for supplying electrical current for operator supplied electrical options.

This outlet has 12 volt electrical current available at all times.

CAB/ CANOPY

The excavator has an operator canopy (ROPS/TOPS) (Roll Over Protective Structure/Tip Over Protective Structure) as standard equipment. An enclosed cab (ROPS/TOPS) is provided as an option. The ROPS/TOPS meets ISO 12117.

Both the cab and canopy provide operator protection if the excavator is tipped over. Always have the seat belt fastened when operating the excavator.



WARNING

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

W-2069-0100

CAB/CANOPY FOGS (Falling Object Guards)

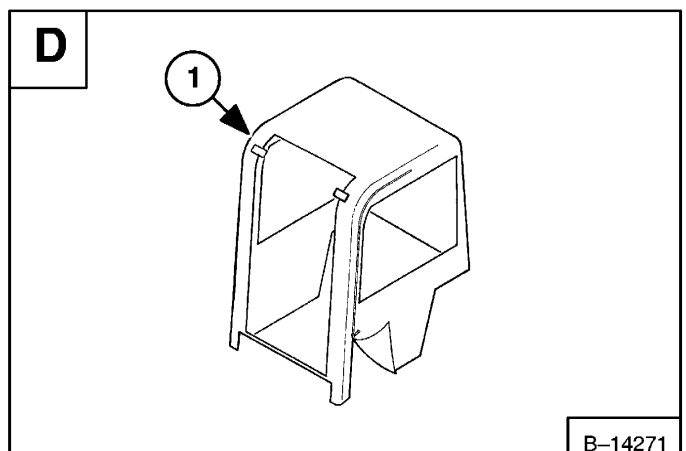
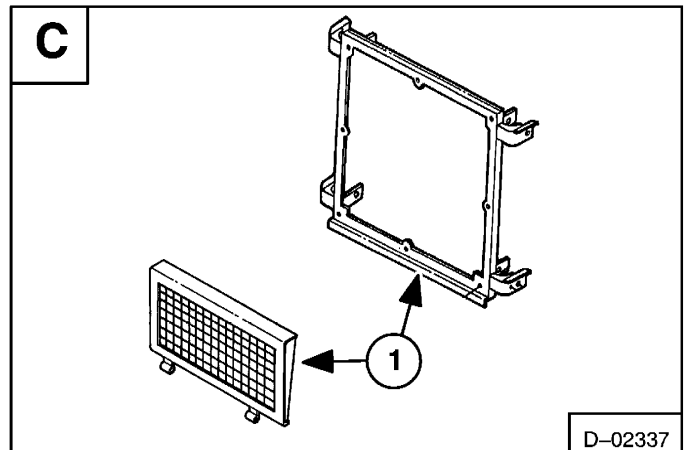
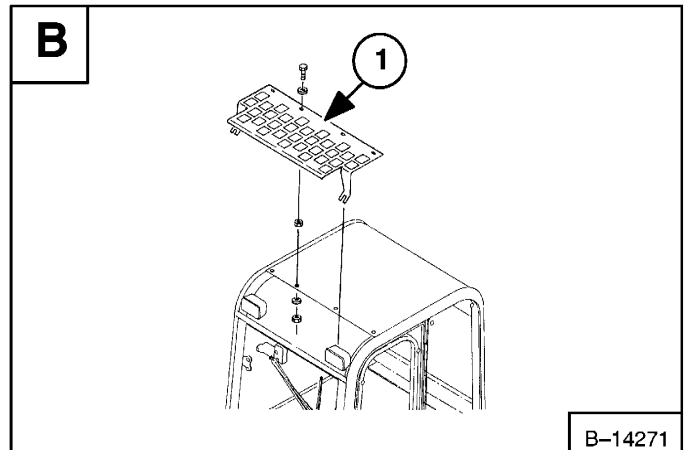
A cab/canopy FOGS (Falling Object Guards) (Item 1) **[B]** is available as a field installed accessory.

For the cab/canopy to meet the FOGS (Falling Object Guards) (ISO 10262-level 1). The excavator must have the overhead guard (Item 1) **[B]** and Special Application Kit (Item 1) **[C]** installed.

See your excavator dealer to order these kits.

A vinyl canopy enclosure kit (Item 1) **[D]** is available as a field installed accessory.

See your excavator dealer to order this part.



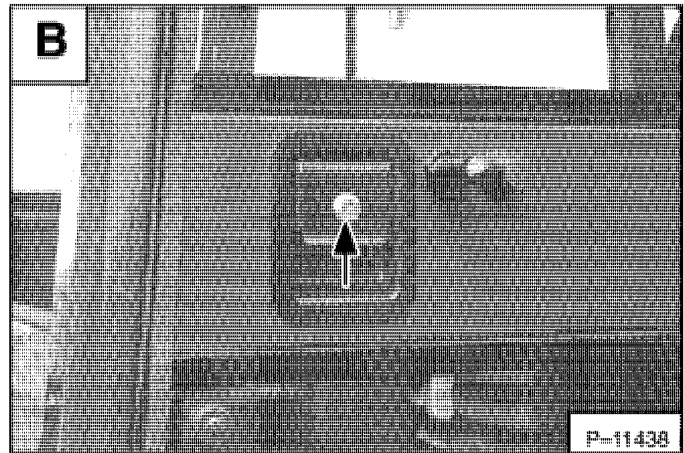
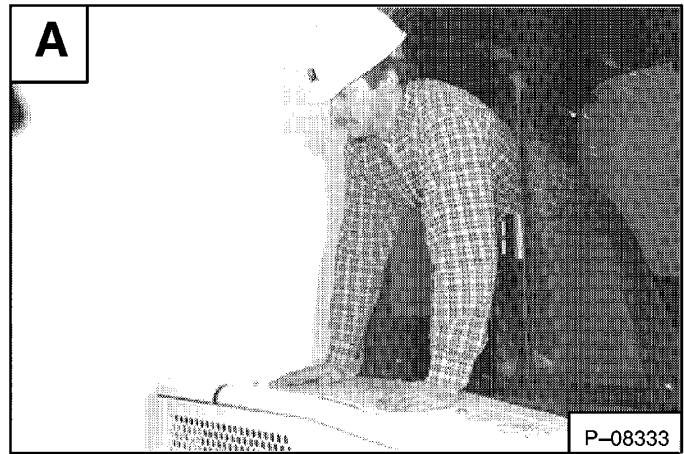
CAB OPTION

Emergency Exit

The left door and right rear window provide exits.

To exit through the right rear side window:

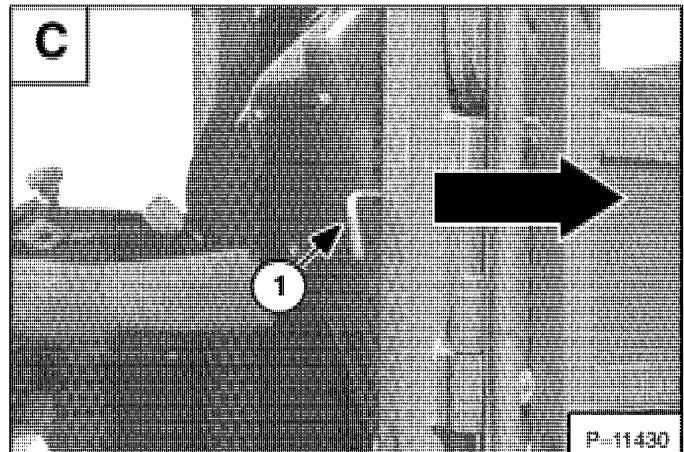
Slide the window to the front of the excavator and exit through the side window [A].



Cab Door

The cab door is lockable and uses the same key as the starter switch [C].

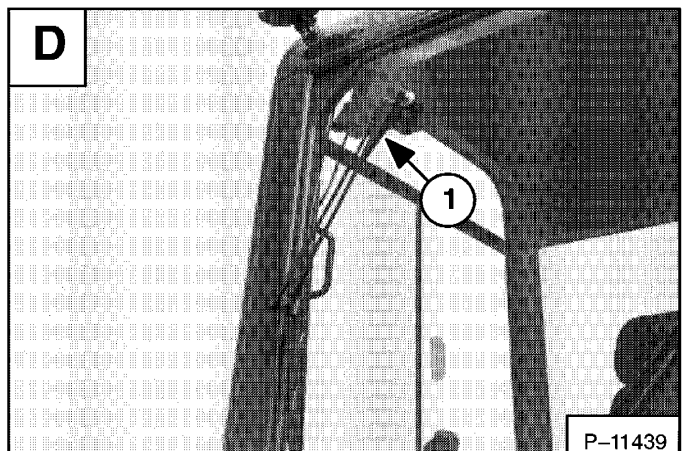
The cab door can be locked in the open position. To release the cab door, push the rod (Item 1) [C] to the rear of the excavator and close the door.



Front Window

The front window (on the optional cab) provides protection from the elements for the operator. The front window is equipped with a wiper (Item 1) [D] and washer.

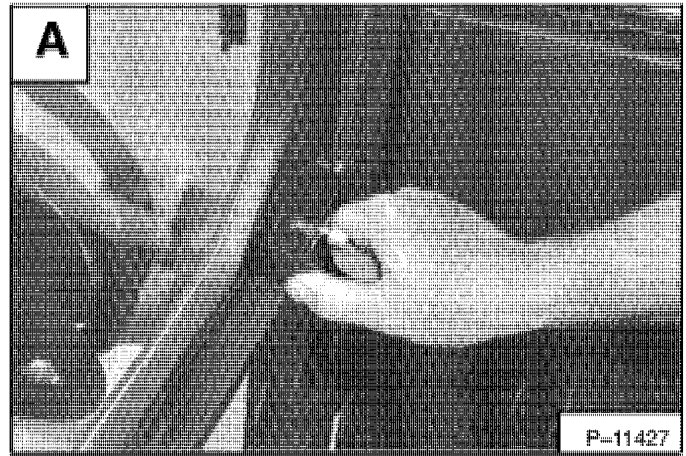
NOTE: A special application kit (consisting of an upper lexan window and a lower screened guard) are available and recommended for use with the hydraulic breaker attachment. See your dealer for availability.



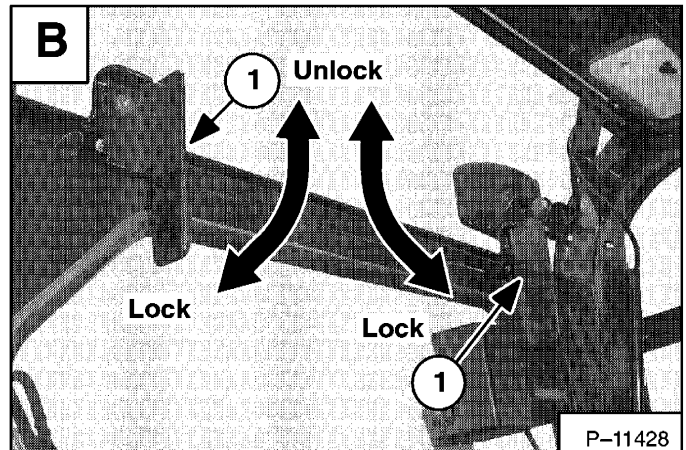
CAB OPTION (Cont'd)

Opening The Front Window

Move the two bottom window latch pins in and put them in the unlatched position **[A]**.



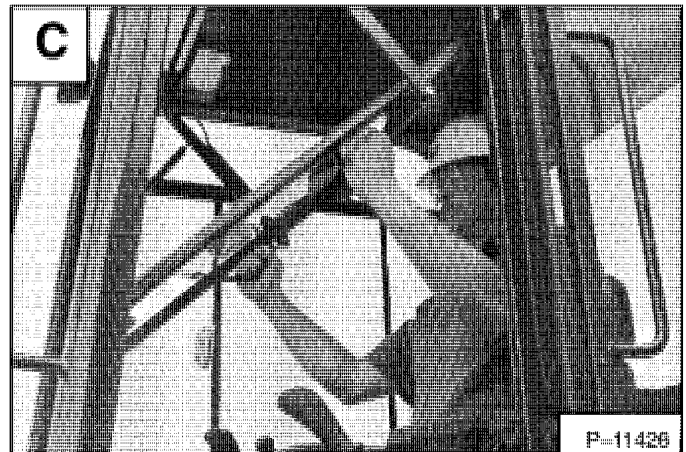
Rotate the two top latches (Item 1) **[B]** to the unlocked position.



Grasp both window handles and pull the top of the window in **[C]**.

When the top of the window moves in, lift up on the window handles and the window will move up and will pivot in, over the operators head.

When the window is over the operators head, lift the bottom of the window up. The top edge of the window will engage the pocket at the top rear of the cab.



Hold the bottom of the window up and move the two bottom window latch pins out. Make sure that the pins are secured to the open window latch points **[D]**.

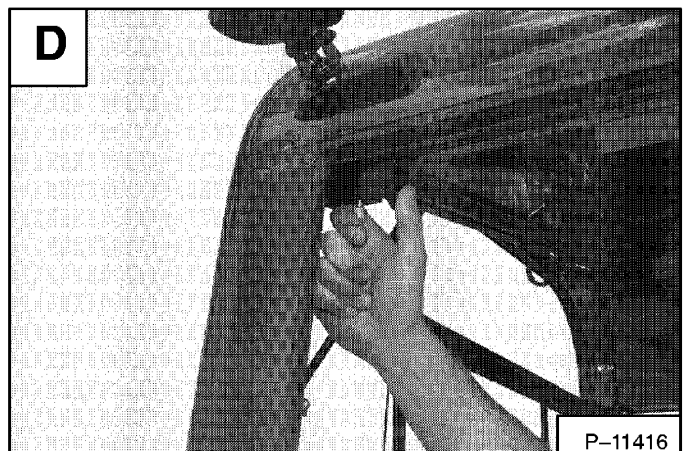
Closing The Front Window

Hold the bottom of the window up and move the two window latch pins in and place them in the unlatched position **[D]**.

Grasp both window handles and pull the bottom of the window down **[C]**.

Rotate the two top latches (Item 1) **[B]** to the locked position.

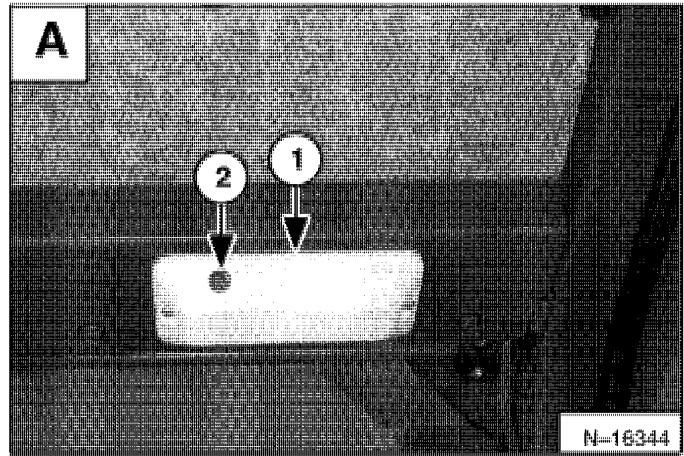
Push out at each bottom corner latch point and move the latch pins into the locked position **[A]**.



CAB OPTION (Cont'd)

Interior Light

The cab overhead console has an interior light (Item 1) [A]. Push the button (Item 2) [A] on the side of the light for illumination.

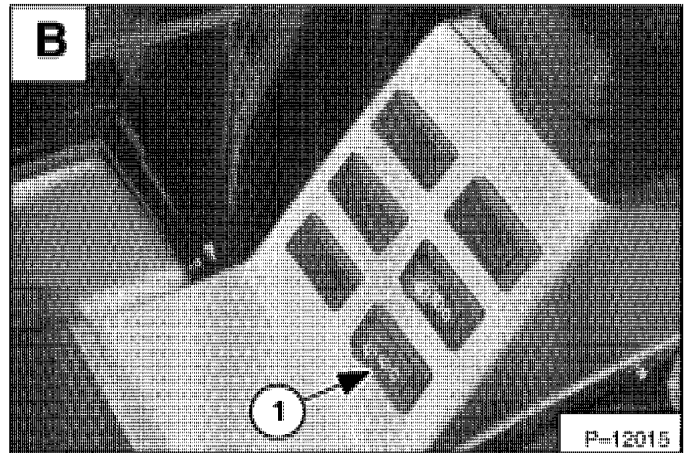


Wiper Washer Switch

The wiper/washer switch is located on the left console (Item 1) [B].

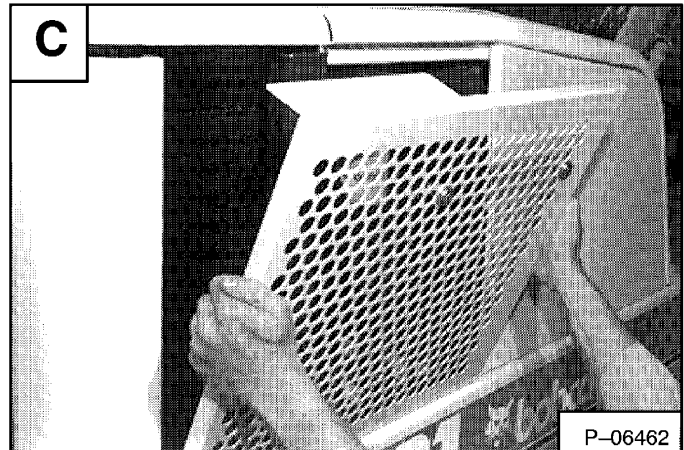
The wiper/washer switch is a three position switch: OFF, Wiper, Wiper and Wash.

When this switch (Item 1) [B] is in the ON (center detent), the wiper is activated. When pushed farther to the left and held, the wiper is activated plus the washer motor. The washer sprays fluid on the window and the wiper will continue to run.



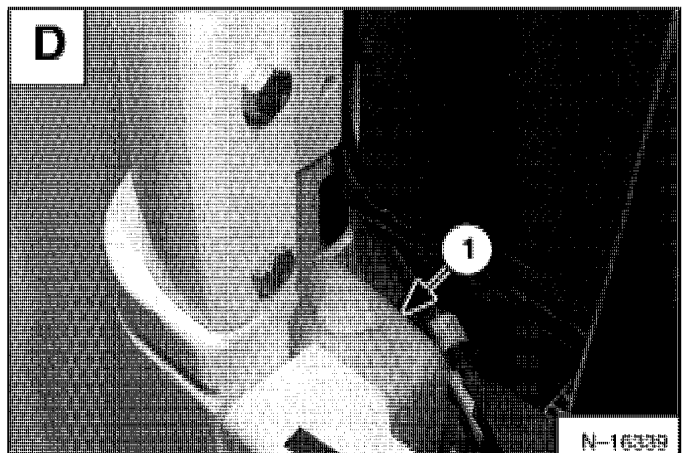
Windshield Washer Tank

Using the start key, unlock and remove the right side cover [C].



The washer tank is located in the right rear of the engine compartment.

Remove the cap (Item 1) [D] and fill the reservoir with washer fluid. In cold weather, use the washer fluid at full strength to prevent freezing.



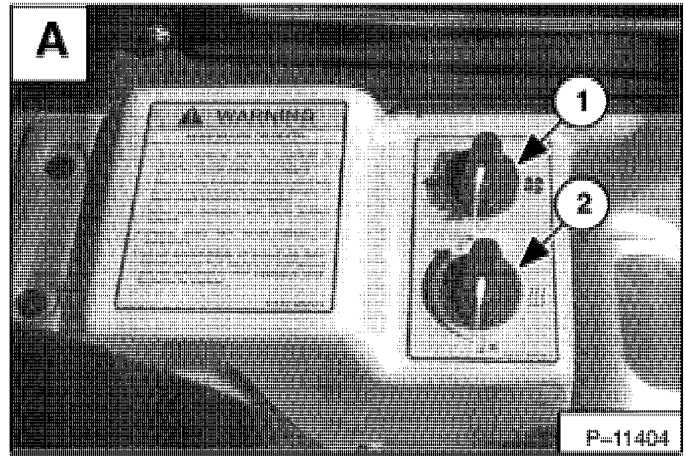
CAB OPTION (Cont'd)

Heater Control

The heater controls are located on the left console.

Turn the fan switch (Item 1) **[A]** to activate the fan. The switch positions are: OFF–LOW–MED–HI.

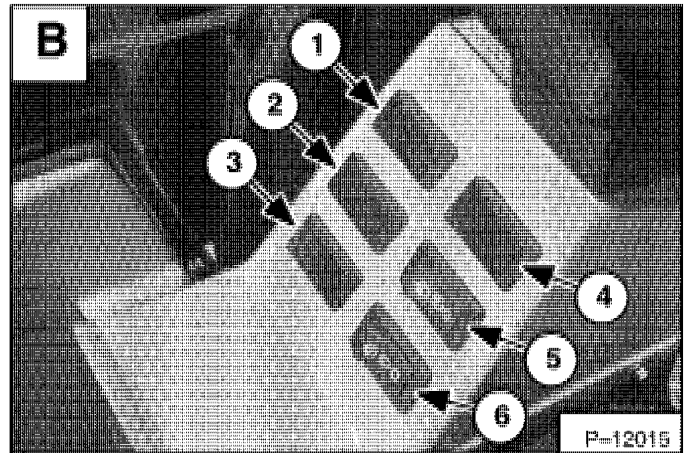
Turn the temperature switch (Item 2) **[A]** clockwise to increase the temperature, and counterclockwise to decrease the temperature.



CONSOLE SWITCHES

The switches are located on the left console **[B]**.

1. Switch position – The switch will be installed and used for future functions and/or attachments.
2. Switch (if equipped) – overhead beacon: When this switch is in the ON position, the optional overhead beacon will be activated **[B]**.
3. Switch position – The switch will be installed and used for future functions and/or attachments.
4. Switch position – The switch will be installed and used for future functions and/or attachments.
5. Switch (Standard) – Headlights: When this switch is in the ON (center detent) position, the head lights are activated. When pushed farther to the left (left detent) the head lights are activated plus the available boom work light **[B]**.
6. Switch (Cab option) – Wiper/Washer: When this switch is in the ON (center detent), the wiper is activated. When pushed farther to the left and held, the wiper is activated plus the washer motor. The washer sprays fluid on the window and the wiper will continue to run **[B]**.

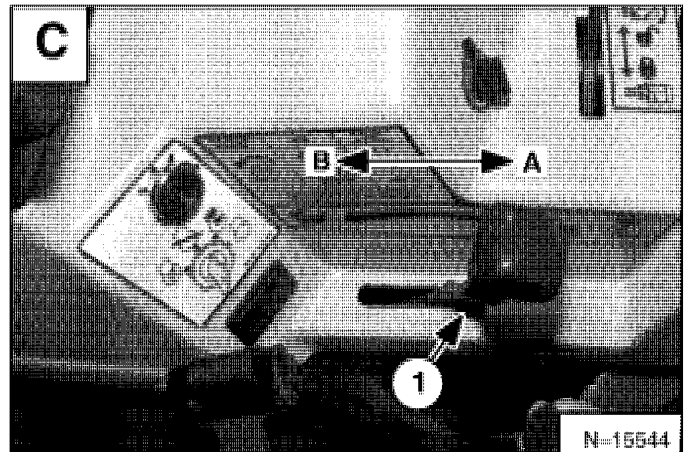


SPEED CONTROL LEVER

The speed control lever (Item 1) **[C]** is used to control the engine speed.

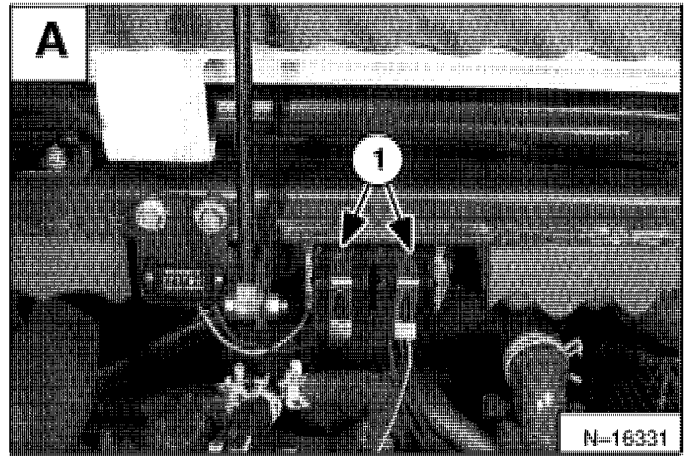
LOW IDLE POSITION – Pull the lever backward (position A) for low idle.

HIGH IDLE POSITION – Push the lever fully forward (position B) for full engine RPM.

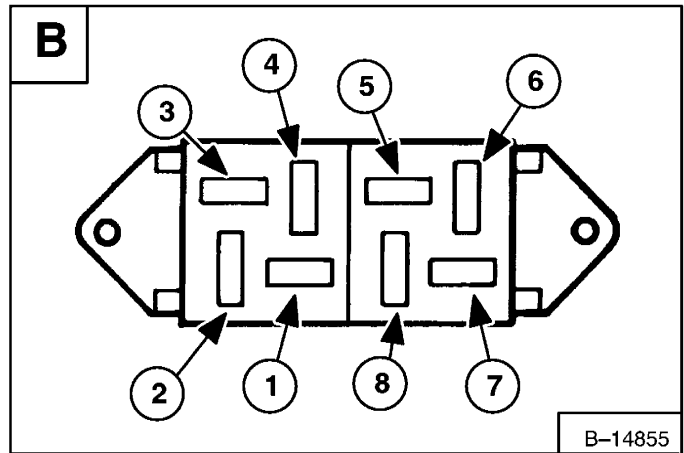


FUSES

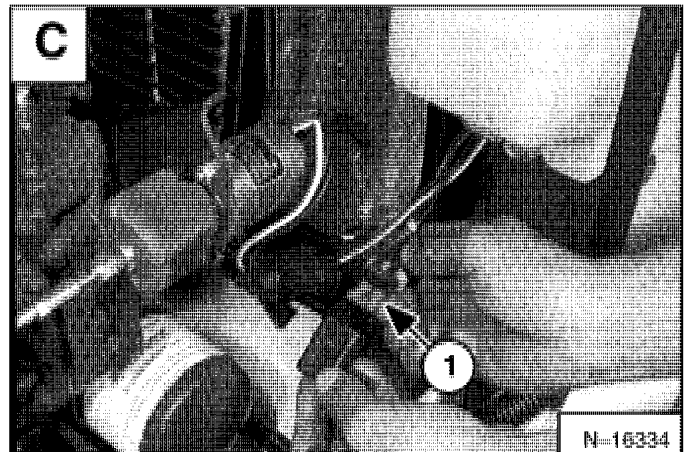
The fuses are located in the engine compartment. Remove the two fuse block covers (Item 1) [A].



1. **FUSE – 10 AMP:** This fuse supplies power to the instrument circuit [B].
2. **FUSE – 10 AMP:** This fuse supplies power to timer solenoid [B].
3. **FUSE – 20 AMP:** This fuse supplies power to the start circuit [B].
4. **FUSE – 15 AMP:** This fuse supplies power to the cab wiring (if equipped) [B].
5. **FUSE – 15 AMP:** This fuse supplies power to any accessory that has constant power [B].
6. **FUSE – 20 AMP:** This fuse supplies power to the horn and heater motor (if equipped) [B].
7. **FUSE – 5 AMP:** This fuse supplies power to the optional wiper motor [B].
8. **FUSE – 20 AMP:** This fuse supplies power to the lights, and any future functions and/or attachments.



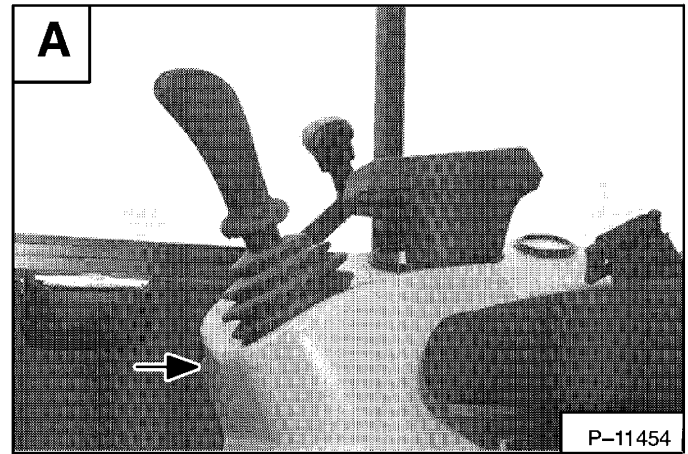
The fuse (Item 1) [C] is a 25 AMP fuse that is used on the timer solenoid in addition to (Item 2) [B].



AUDIBLE ALARM

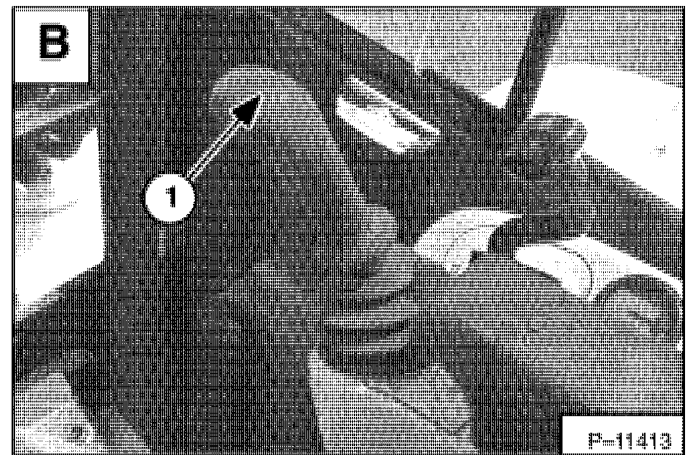
An audible alarm, located in the right hand console **[A]**, will sound when these conditions exist:

- When the key is in the ON position with the engine stopped.
- When there is low engine oil pressure.
- When there is high engine coolant temperature.



HORN BUTTON

The horn button (Item 1) **[B]** is located in the right control lever (joystick) grip.



SEAT

The operator seat can be adjusted as follows:
(Adjustments should be made with the operator seated).

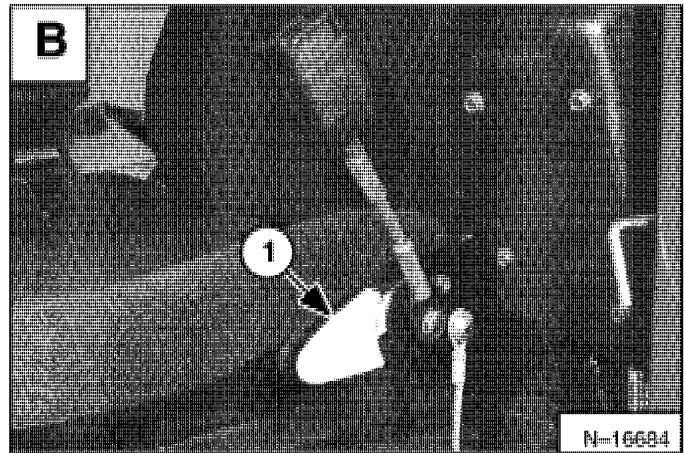
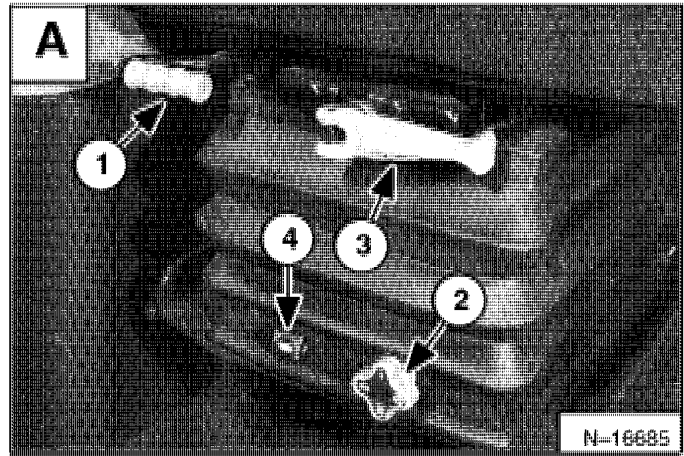
Release the seat adjustment lever (Item 1) [A]. Slide the seat backward or forward for easy reach of the machine controls.

Select the height position number at the bottom of the knob (Item 2) [A].

Turn the weight adjustment handle (Item 3) [A] until the number in the window (Item 4) [A] matches the number on the bottom of the knob (Item 2) [A].

NOTE: Turn the handle (Item 3) [A] clockwise (as viewed in the photo) to increase weight adjustment, counterclockwise to decrease weight adjustment.

Lift the lever (Item 1) [B] up to adjust the back of the seat for operator comfort.



OPERATOR'S HANDBOOK

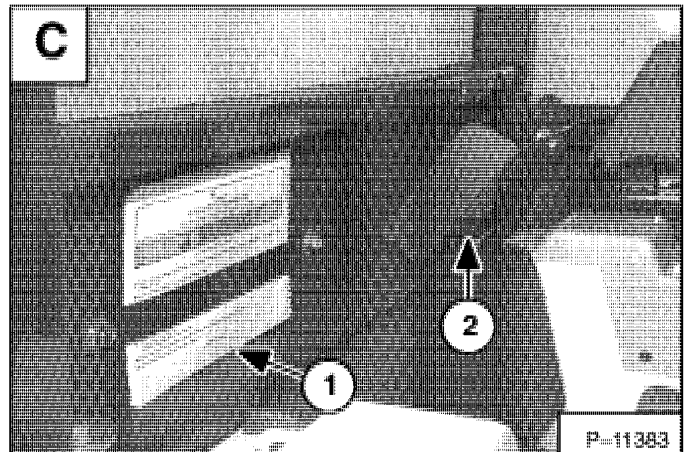
The Operator's Handbook (Item 1) [C] is a quick reference for operating the hydraulic excavator and is located behind the operator seat on the right side of the cab/canopy.

Read the Operation & Maintenance Manual and Operator's Handbook before operating the hydraulic excavator.

STORAGE COMPARTMENT

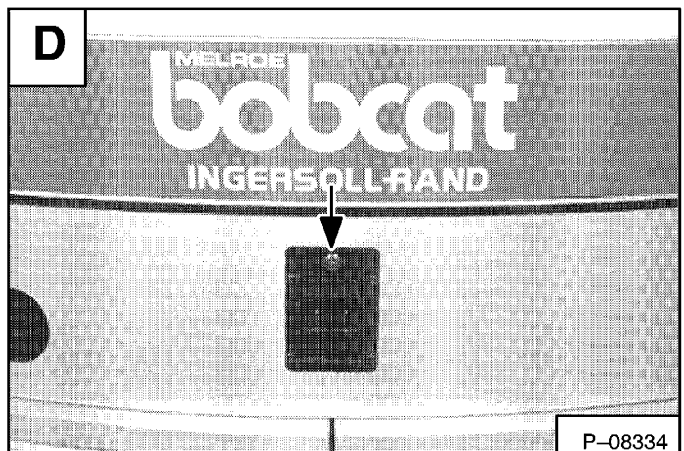
The locking storage compartment (Item 2) [C] is located behind the operator seat at the left side of the cab/canopy. The storage compartment lock uses the same key as the start switch. The Operation & Maintenance Manual is stored in the storage compartment.

Read the Operation & Maintenance Manual and Operator's Handbook before operating the hydraulic excavator.



ENGINE COVER

The engine cover is lockable and uses the same key as the start switch [D].



AUXILIARY HYDRAULIC PEDAL

Quick Couplers

Current excavators and attachments have flush faced couplers (Item 1) [A].

! 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

To Connect: Remove any dirt or debris from the surface of both the male and female coupler halves, 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) [A] must be replaced.

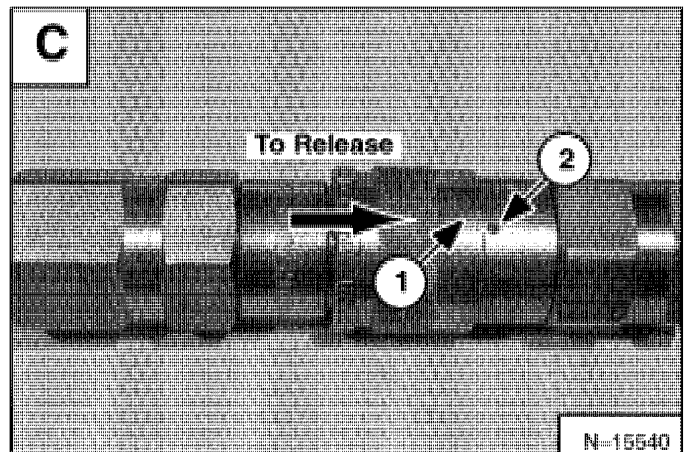
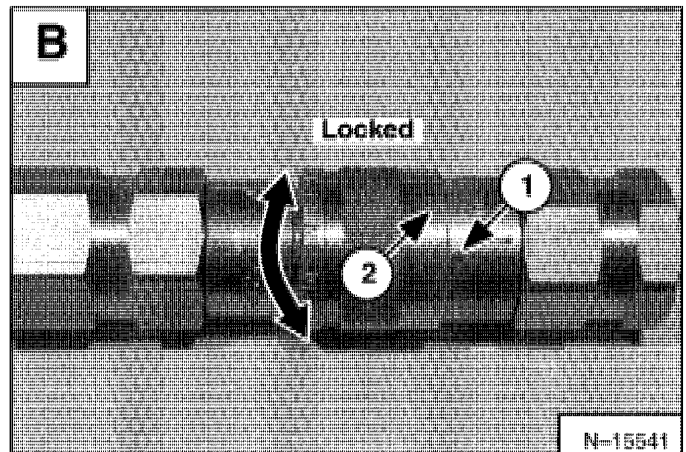
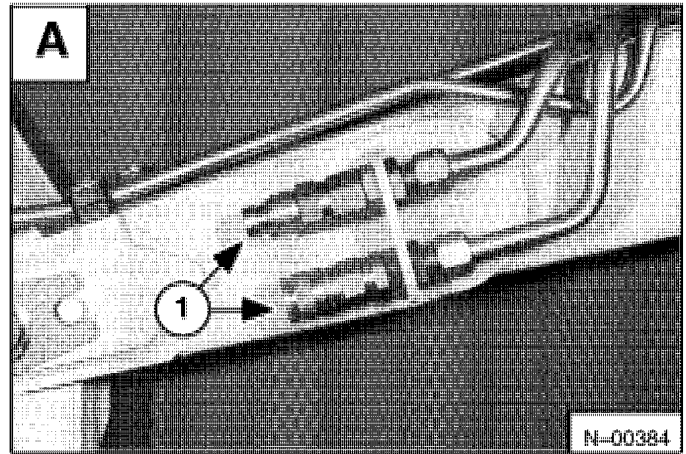
Install the male half coupler into the female half coupler. Full connection is made when the ball release sleeve slides forward on the female coupler and the sleeve is rotated.

Install the male half coupler into the female half coupler. Full connection is made when the ball release sleeve slides forward on the female coupler and the sleeve is rotated so that the locking pins (Item 1) [B] and the groove (Item 2) [B] do NOT align (Locked Position). This will prevent accidental disconnection.

NOTE: If the locking pins and grooves (Item 1) [C] are aligned, accidental disconnection is possible.

To Disconnect: Rotate the ball release sleeve so that the grooves (Item 1) [C] are aligned with the pins (Item 2) [C] in the female coupler.

Hold the male coupler. Retract the sleeve on the female coupler until the couplers disconnect.



AUXILIARY HYDRAULIC PEDAL (Cont'd)

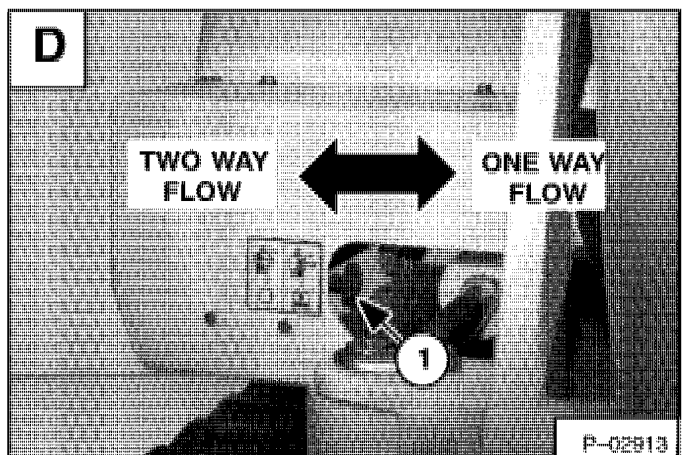
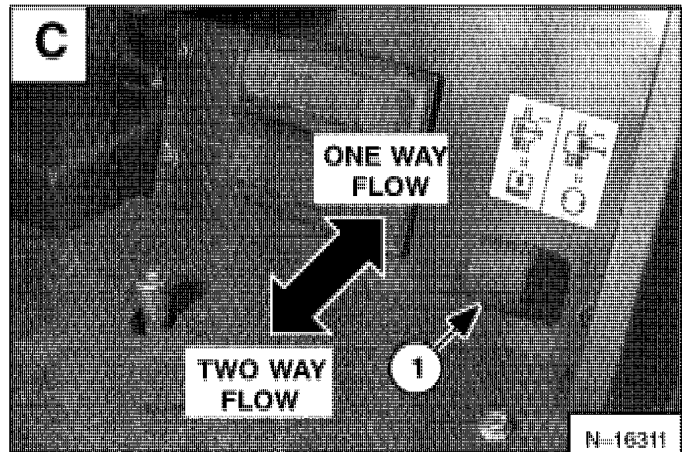
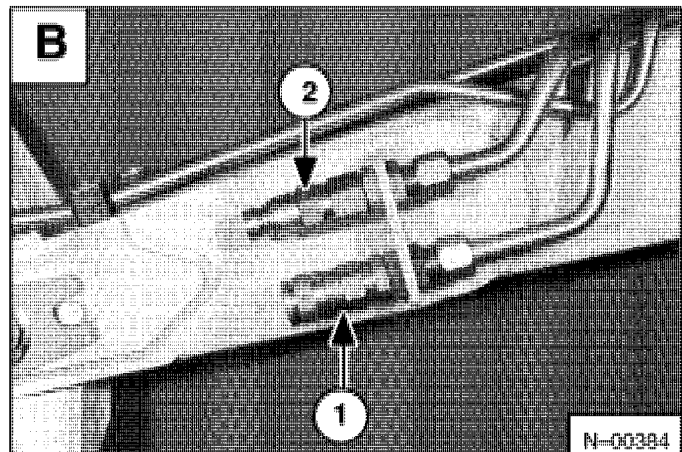
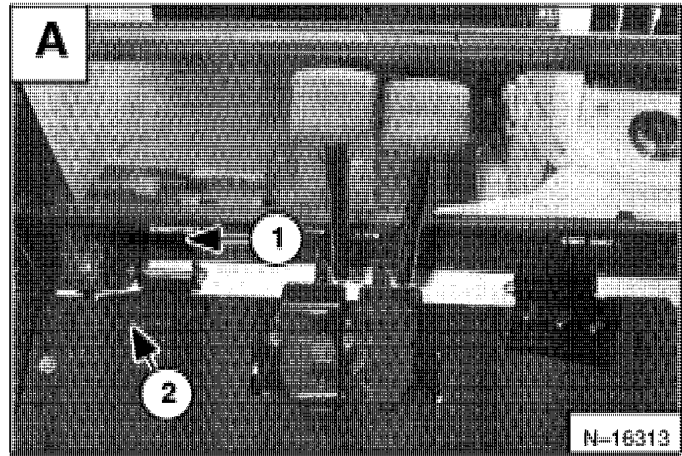
Operation

Raise the pedal lock/foot rest (Item 1) [A] to operate the auxiliary operation pedal.

The auxiliary operation pedal (Item 2) [A] controls the auxiliary quick couplers mounted on the left side of the boom.

The excavator is equipped with two-way flow auxiliary lines. Push the pedal (Item 2) [A] to activate hydraulic function.

The female coupler (Item 1) [B] is pressurized when the pedal is pushed to the right and the male coupler (Item 2) [B] is pressurized when the pedal is pushed to the left.



! WARNING

AVOID INJURY OR DEATH

Before moving the auxiliary flow control knob:

- Lower the blade to the ground.
- Lower the bucket to the ground.
- Shut-off the engine.

W-2198-0595

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

DIRECT TO TANK VALVE (If Equipped)

If the excavator is equipped with a direct to tank valve, the valve can be located in either the cab (Item 1) [C] or in the right front corner of the frame (Item 1) [D] by the boom swing cylinder.

The direct to tank valve (Item 1) [C] or [D] controls the return hydraulic flow for the auxiliary couplers.

Breaker Operation:

If the excavator is equipped with a direct to tank valve, push the knob (Item 1) [C] in or pull the knob (Item 1) [D] out. This will allow hydraulic flow to the female coupler (Item 1) [B] only. Return hydraulic flow through the male coupler (Item 2) [B] will return to the hydraulic tank with less back pressure which is required for some brands of breakers to operate correctly.

NOTE: Some brands of breakers (non Bobcat built) will require a direct to tank valve for correct operation. See your excavator dealer for a direct to tank valve kit.

Auger And Other Attachment Operation:

If the excavator is equipped with a direct to tank valve, pull the flow control knob (Item 1) [C] out or push the flow control knob (Item 1) [D] in. This will allow hydraulic flow to be directed to either the female coupler (Item 1) [B] or the male coupler (Item 2) [B].

EXTENDABLE ARM

Operation

Put the flow control knob in the two way flow position (if equipped). (See Page 14.)

Raise the pedal lock/foot rest (Item 1) [A] to operate the auxiliary operation pedal.

Push the pedal (Item 2) [A] to the left to extend the arm (Item 1) [B].

Push the pedal (Item 2) [A] to the right to retract the arm (Item 1) [C].



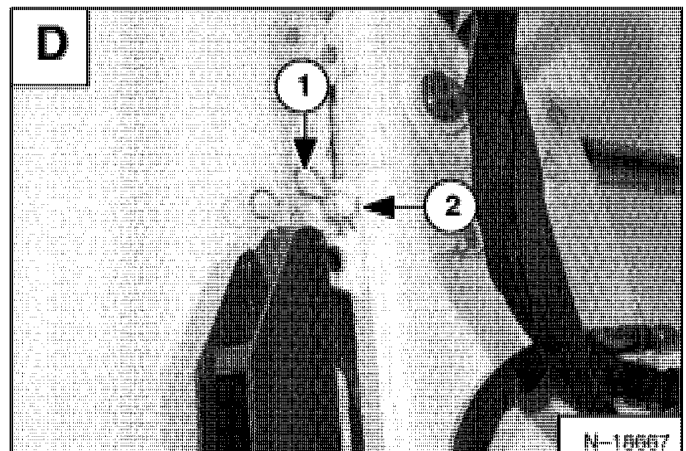
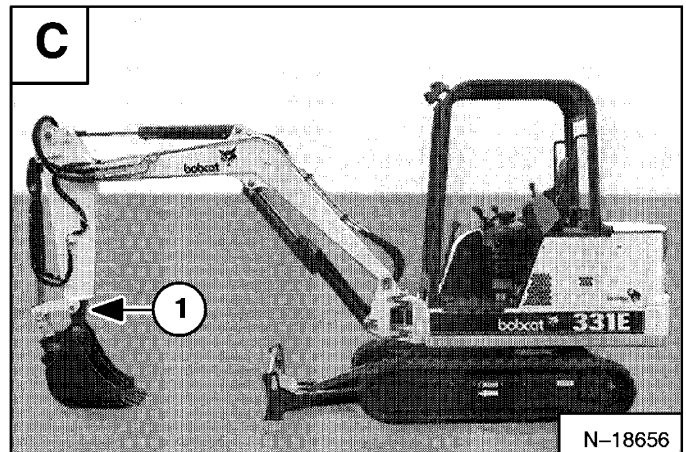
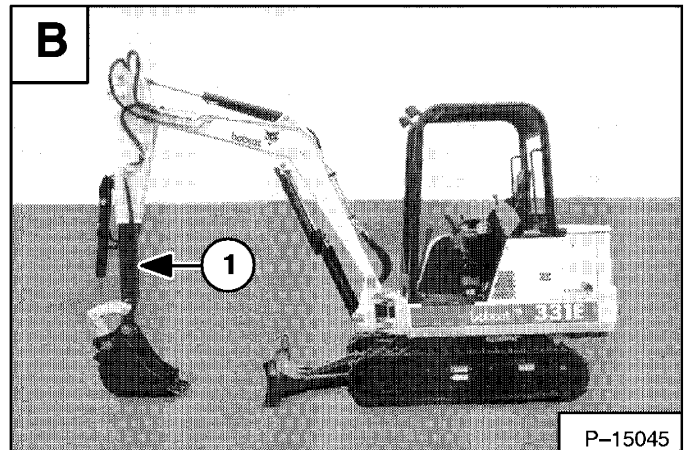
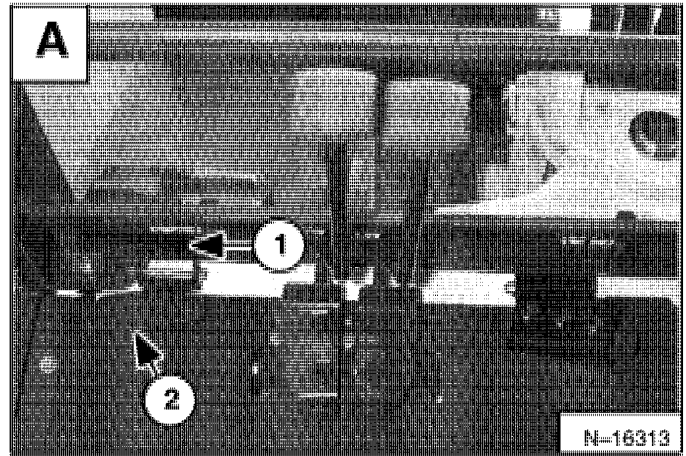
WARNING

The lifting capacity of the Excavator is reduced when the arm is extended. See the Lift Capacity Chart for rated lift capacity with the arm retracted and arm extended.

W-2353-0599

When using a hydraulic operated attachment, the arm must be fully retracted. Remove the retaining pin (Item 1) [D] from the lock pin (Item 2) [D].

Remove the lock pin (Item 2) [D] from the storage position.

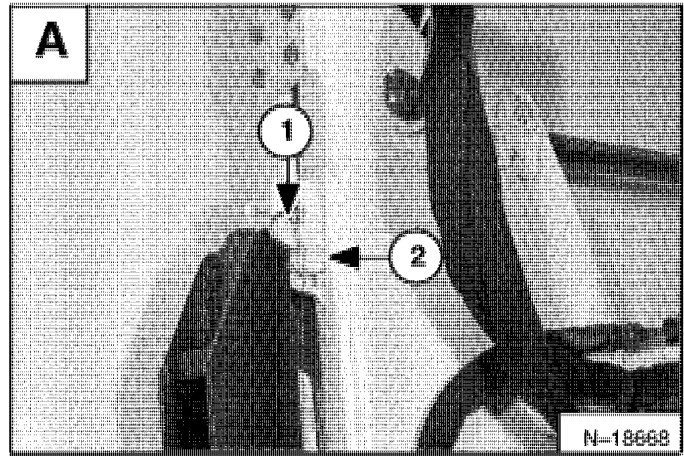


EXTENDABLE ARM (Cont'd)

Operation (Cont'd)

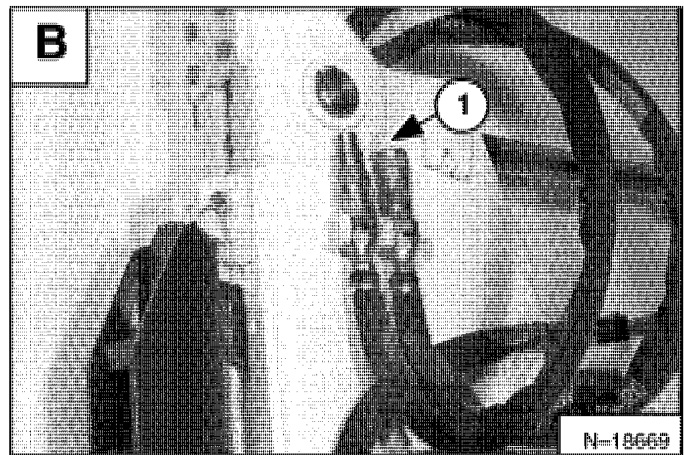
Install the lock pin (Item 1) **[A]** through the bucket cylinder mount. Install the retaining pin (Item 2) **[A]** in the lock pin.

Disconnect the hoses from the quick couplers. (See Page 13.)



Put the hoses (Item 1) **[B]** in the storage position.

Install the attachment hydraulic lines to the Excavator auxiliary quick couplers. (See Page 13.)



CONTROL LEVERS (JOYSTICKS)

The work equipment is operated by using the left and right control levers (joysticks) **[A]** & **[B]**. (See Page 56 and 57 for ISO/Standard Control Pattern change information.)

Operation Of Left Control Lever (ISO)

Arm and Swing.

The left lever is used to operate the arm and to swing the upperstructure **[A]**:

1. Arm out.
2. Arm out and swing right.
3. Swing right.
4. Arm in and swing right.
5. Arm in.
6. Arm in and swing left.
7. Swing left.
8. Arm out and swing left.

IMPORTANT

Before swinging the upperstructure, make sure the swing lock is disengaged.

I-2051-0189

Operation Of Right Control Lever (ISO)

Boom and Bucket.

The right lever is used to operate the boom and bucket **[B]**.

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

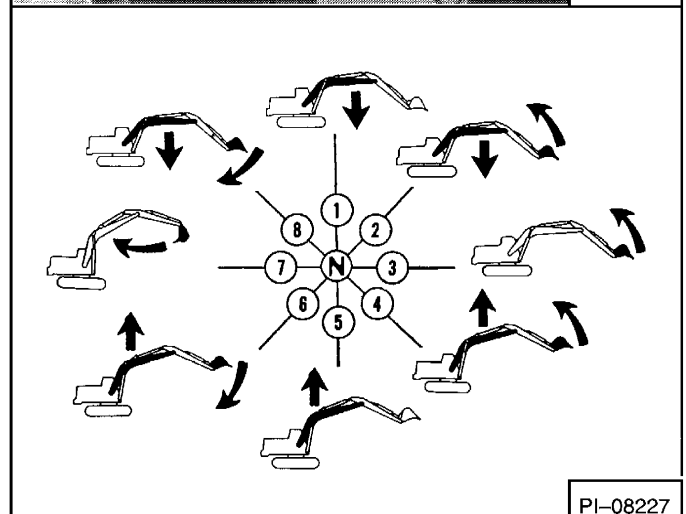
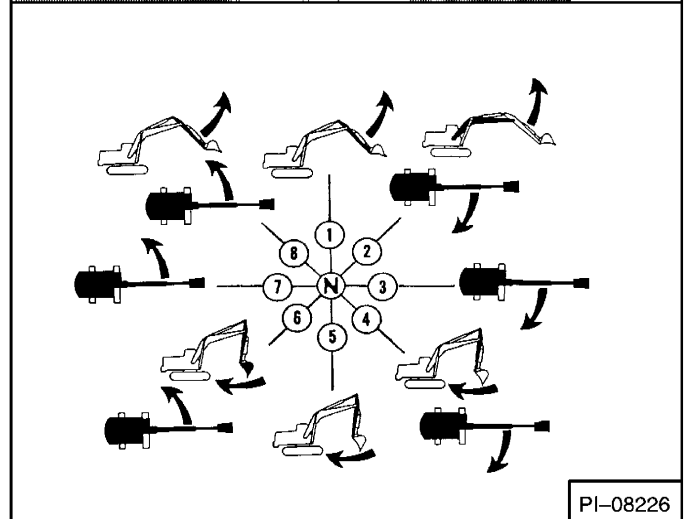
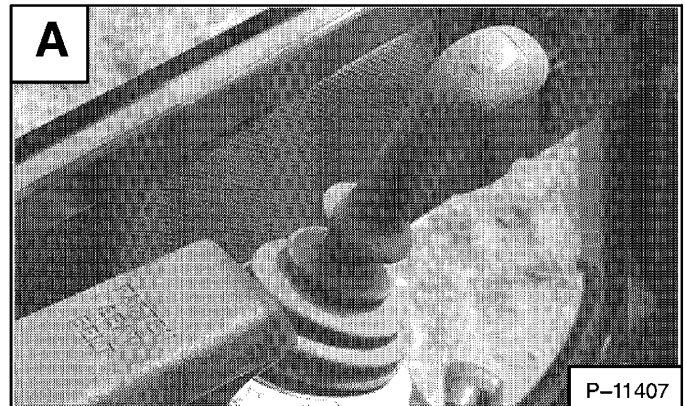
! WARNING

AVOID INJURY OR DEATH

Before leaving the machine:

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

W-2196-0595



CONTROL LEVERS (JOYSTICKS) (Cont'd)

The work equipment is operated by using the left and right control levers (joysticks) **[A]** & **[B]**. (See Page 56 and 57 for ISO/Standard Control Pattern change information.)

Operation Of Left Control Lever (Standard)

Boom and Swing.

The left lever is used to operate the boom and swing the upperstructure **[A]**:

1. Boom lower.
2. Boom lower and swing right.
3. Swing right.
4. Boom raise and swing right.
5. Boom raise.
6. Boom raise and swing left.
7. Swing left.
8. Boom lower and swing left.

IMPORTANT

Before swinging the upperstructure, make sure the swing lock is disengaged.

I-2051-0189

Operation Of Right Control Lever (Standard)

Arm and Bucket.

The right lever is used to operate the arm and bucket **[B]**:

1. Arm out.
2. Arm out and bucket dump.
3. Bucket dump.
4. Arm in and bucket dump.
5. Arm in.
6. Arm in and bucket curl.
7. Bucket curl.
8. Arm out and bucket curl.

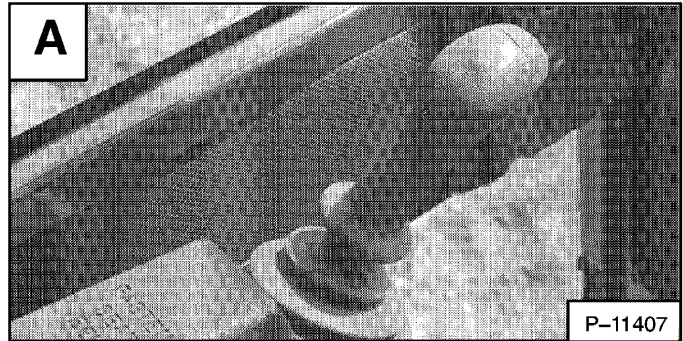
⚠ WARNING

AVOID INJURY OR DEATH

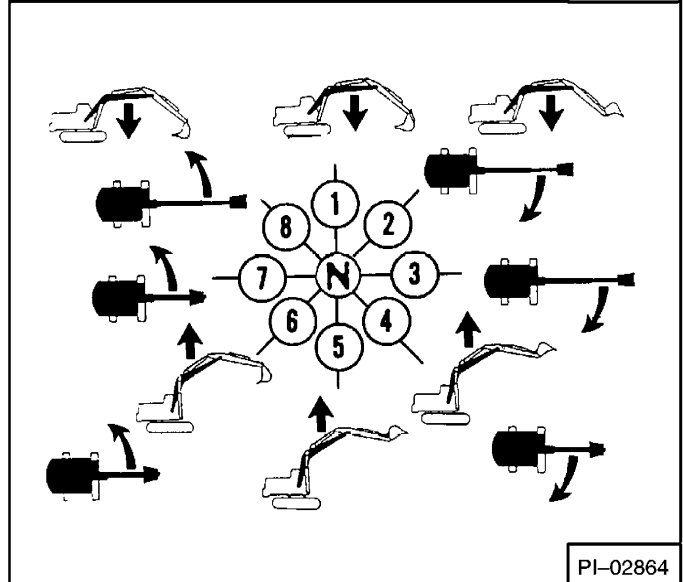
Before leaving the machine:

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

W-2196-0595



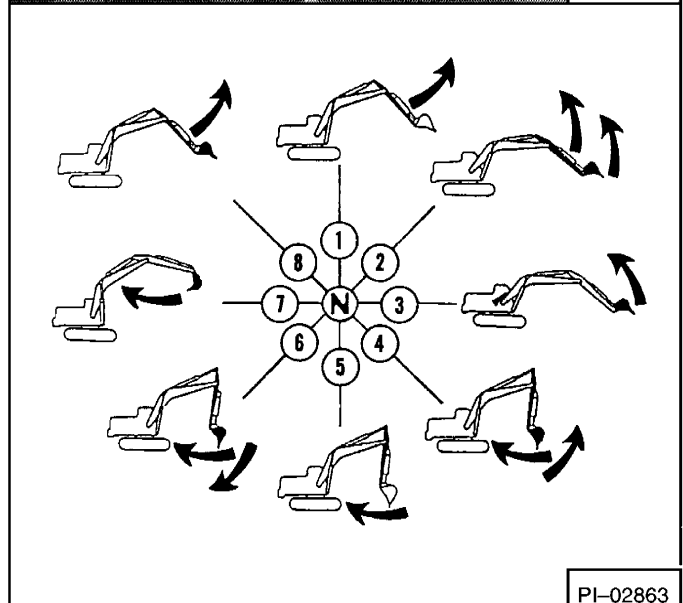
P-11407



PI-02864



P-11413



PI-02863

SWING LOCK

When the swing locking lever (Item 1) [A] is engaged (locked position), the upperstructure of the excavator is locked to the track frame and will not swing.

To engage the swing lock, rotate the upperstructure until it is parallel with the tracks. Pull the swing locking lever (Item 1) [A] to the left to lock.

NOTE: The upperstructure will only lock to the track frame when the upperstructure is parallel with the tracks.

To disengage the upperstructure from the track frame, push the swing locking lever (Item 1) [B] to the right.



WARNING

AVOID INJURY

The swing lock lever must be engaged when transporting the machine.

W-2197-0595

IMPORTANT

Engage the swing lock pin only after the upper works is parallel with the track frame.

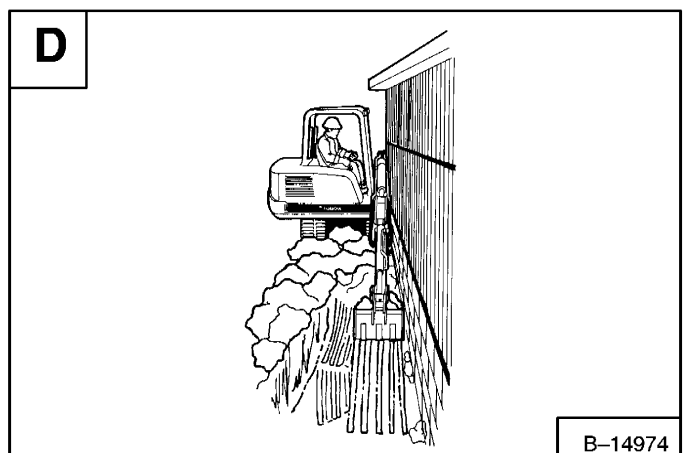
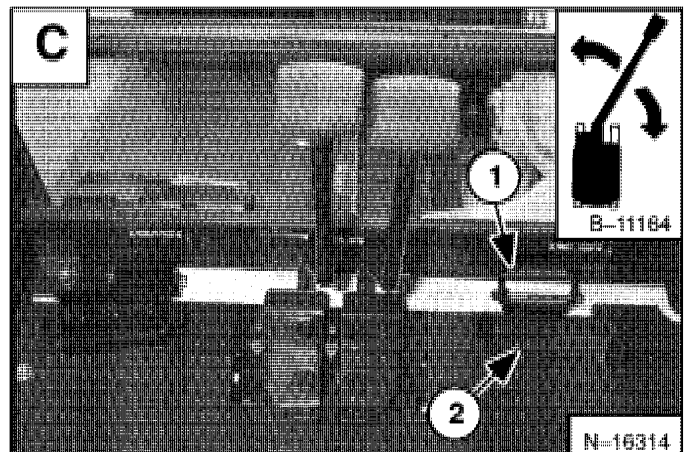
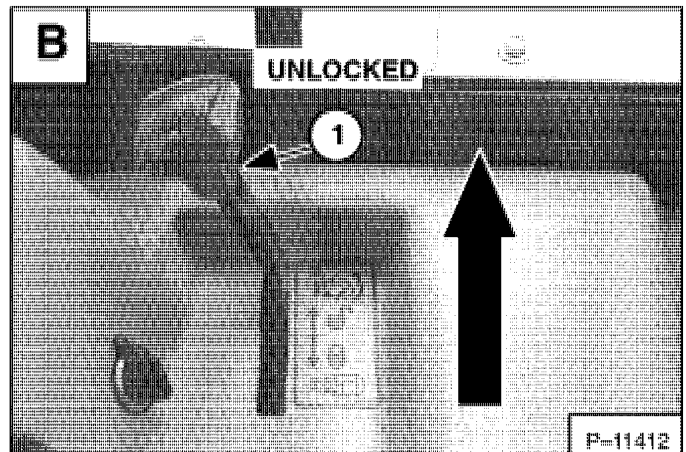
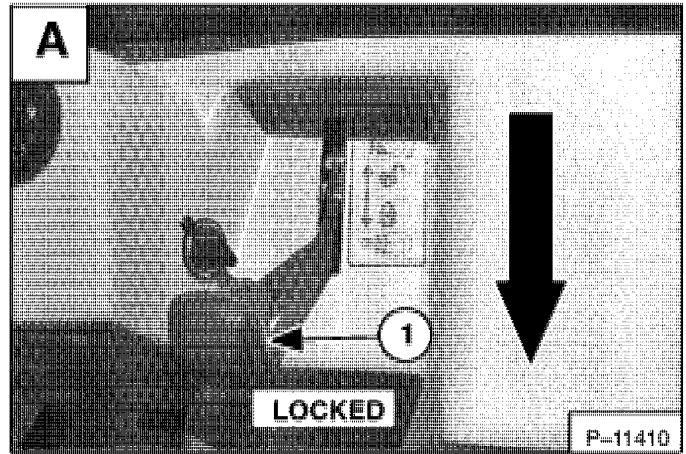
I-2052-0297

BOOM SWING PEDAL

Raise the pedal lock/footrest (Item 1) [C] to operate the boom swing pedal.

Push the pedal (Item 2) [C] to the right to swing the boom to the right and push the pedal to the left to swing the boom to the left.

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



BLADE CONTROL LEVER

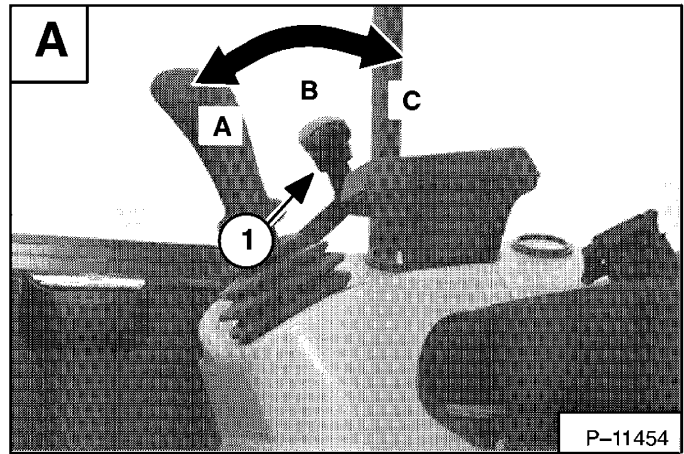
The lever (Item 1) [A] is used to raise and lower the blade.

Position A – Push Forward – Lowers the blade.

Position B – Neutral – Blade is stopped and held in position.

Position C – Pull Backward – Raises the blade.

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



CONTROL LEVER (JOYSTICK) LOCK

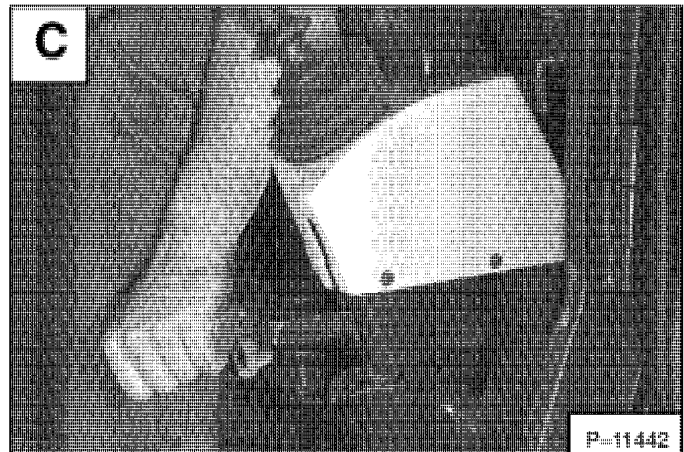
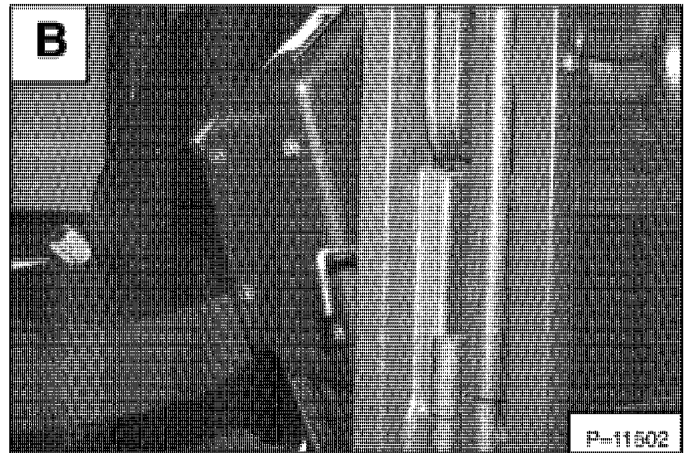
A control lock switch (located in the left hand console) disconnects the hydraulics from the joystick control levers when the control console is in the raised position [B]. (The joystick control levers will not operate with the console raised.)

NOTE: The travel levers, blade lever, boom swing pedal and the auxiliary functions are NOT affected by the control lock.

NOTE: Positioning the key in the run position while the engine is stopped activates the accumulator to provide short term control lever operation.

If the engine is stopped, turn the key to the run position and lower the boom/arm to the ground.

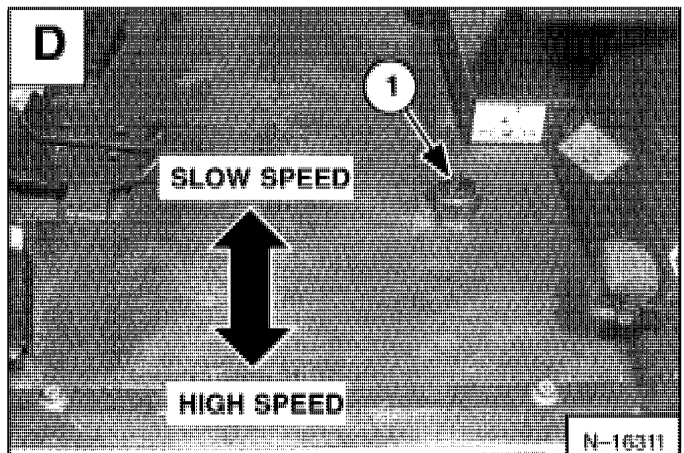
Lower the control console to engage the joystick control levers [C].



TWO SPEED FOOT SWITCH

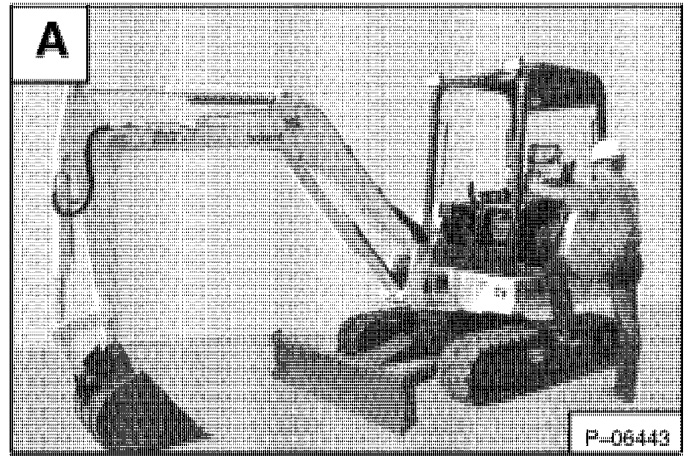
Slow Speed: When the switch (Item 1) [D] is in the up position (Normal).

High Speed: When the switch (Item 1) [D] is pushed and held down.

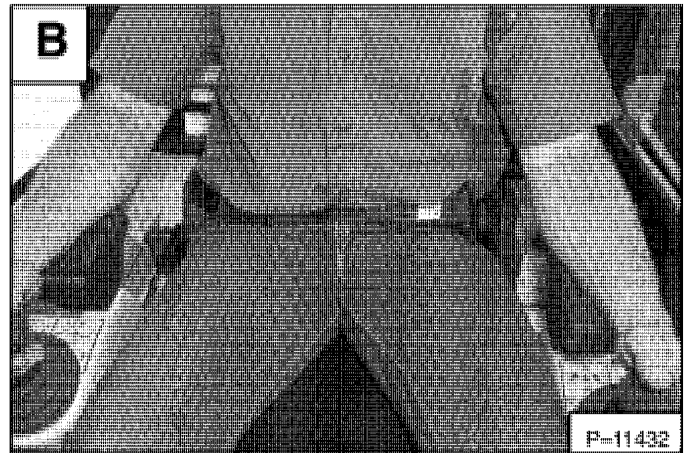


ENTERING AND EXITING THE EXCAVATOR

Use the grab handles, the tracks and the safety treads to enter and exit the excavator **[A]**.



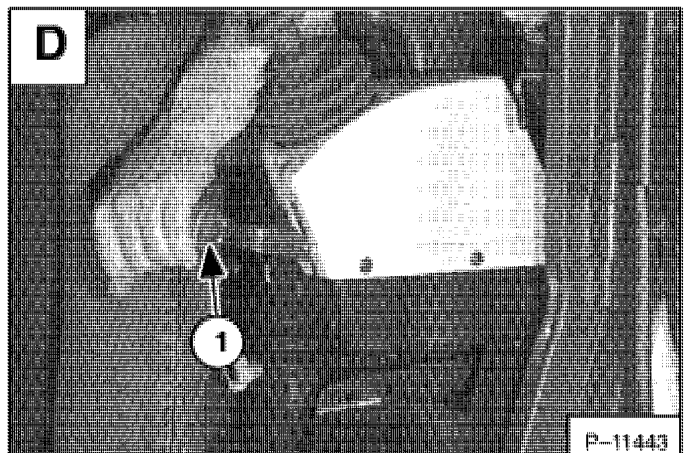
Fasten the seat belt snugly. Adjust the seat belt so that the belt is over the operator's hips **[B]**.



Lower the left control console before starting the engine **[C]**.



To get off of the excavator, lift up on the lever (Item 1) **[D]** to release and raise the control console.



DAILY INSPECTION

Check the following items before each day of operation:

- *Operator Canopy or Cab (ROPS/TOPS) and mounting hardware.
- *Seat belt and mounting hardware.
- *Damaged decals, replace as needed.
- *Air cleaner and intake hoses.
- *Engine coolant level and for coolant leaks.
- *Engine oil level and for engine leaks.
- *Clean engine area of any flammable material.
- *Hydraulic fluid level and system for leaks.
- *Grease all pivot points.
- *Cylinder and attachment pivot points.
- *Track Tension.
- *Repair broken and loose parts.

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

WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, 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. Failure to follow instructions can cause injury or death.

W-2003-1298

STARTING THE ENGINE

Normal Starting Procedure (With Engine Warm)

Fasten the seat belt.

Lower the control console to the locked position.

Put all control levers in the neutral position [A].

Move the engine speed control to low idle [B].

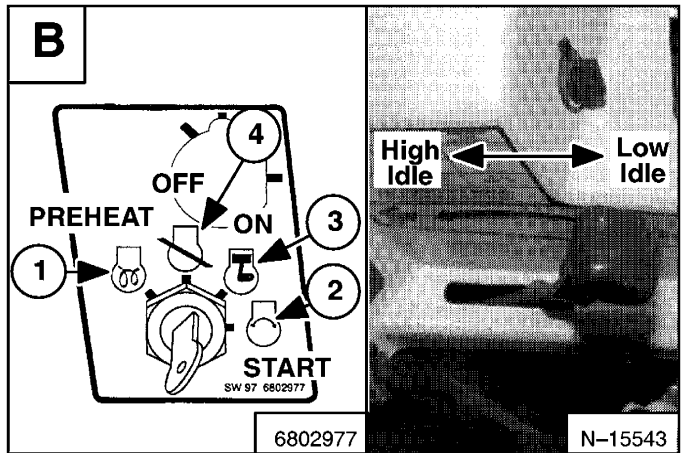
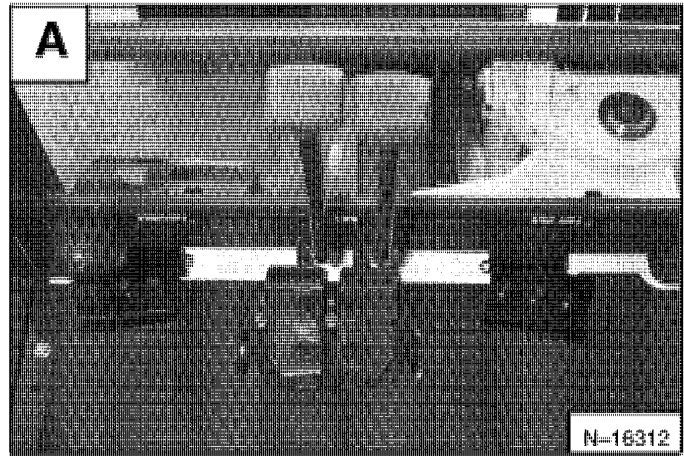
Turn the key to PREHEAT position (Item 1) [B] (if required), the light will come on. Hold the key in the preheat position for 1 to 5 seconds.

Turn the key to the START position (Item 2) [B].

When the engine is started, release the key and it will return to the (ON) run position (Item 3) [B].

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

To stop the engine, turn the key switch to the OFF position (Item 4) [B].



WARNING

Do not use ether with glow plugs (preheat) systems. Explosion can result which can cause injury or death.

W-2071-1285

IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by over heating. Cool the starter for one minute between uses.

I-2034-0284

STARTING THE ENGINE (Cont'd)

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-2050-1285

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

W-2051-1086

Cold Temperature Starting Procedure

Use the following procedure to make starting easier:

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See *ENGINE OIL SPECIFICATIONS* Page 92.)
- Make sure the battery is fully charged.

NOTE: If the battery is discharged (but not frozen) a booster battery can be used to jump start the excavator. (See Page 49.)

Install an engine heater.

Follow the steps under *Normal Starting Procedure* and repeat the steps below until engine starts:

WARNING

Do not use ether with glow plugs (preheat) systems. Explosion can result which can cause injury or death.

W-2071-1285

Push the speed control lever fully forward to the high idle position [A].

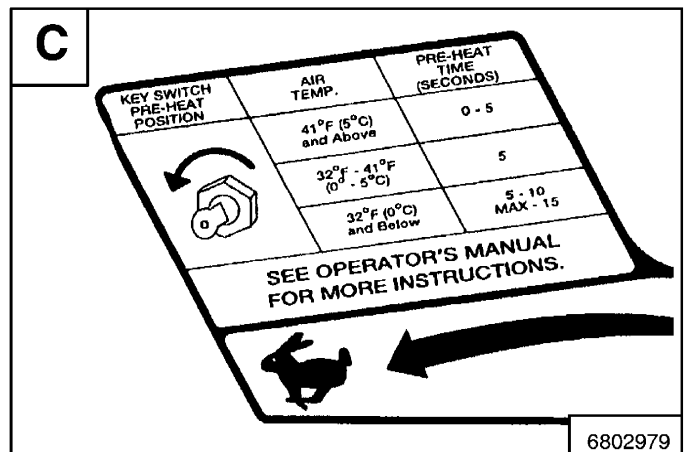
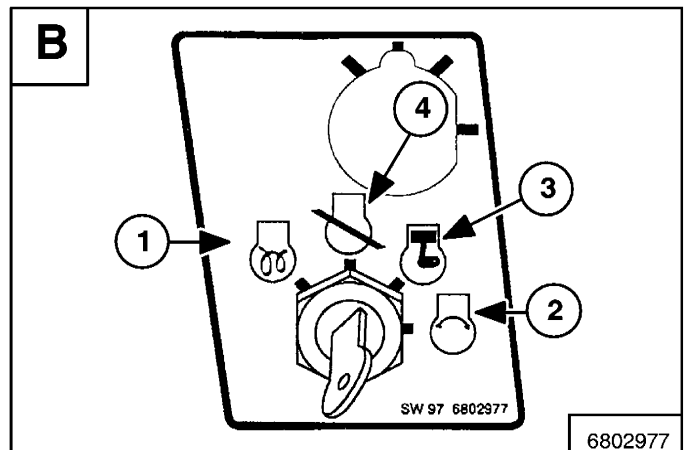
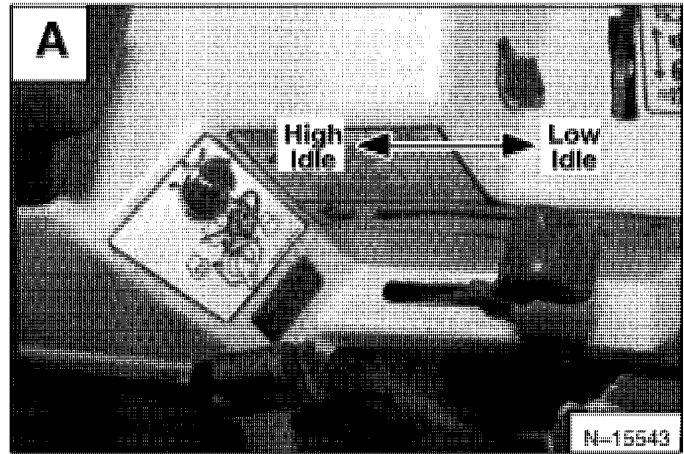
Turn the key to PREHEAT position (Item 1) [B], the light will come on. Preheat the engine as shown in the decal [C] located on the right console.

Turn the key to START position (Item 2) [B] and start the engine.

Release the key, and it will return to the (ON) run position (Item 3) [B].

When the engine speed increases, move the speed control lever immediately to the low idle position [A].

Turn the key to the OFF position (Item 4) [B] to stop the engine.



IMPORTANT

Do not engage the starter for longer than 15 seconds at a time. Longer use can damage the starter by over heating. Cool the starter for one minute between uses.

I-2034-0284

ATTACHMENTS (Pin On)

Removal

NOTE: Removal and Installation of the bucket is shown. The procedure is the same for other attachments. Disconnect any hydraulic hoses that are connected to the auxiliary couplers before removing any attachments (breaker, auger, etc.).

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

Select a flat level surface. Put the bucket on the ground.

Remove the fasteners from the pivot pins (Items 1 & 2) [A].

Remove the pivot pins and keep them clean. Do not damage the dust seals in the arm and the link.

Installation

Install the arm into the bucket and align the hole. Install the pivot pin (Item 1) [A].

Attach the link to the other hole and install the pivot pin (Item 2) [A].

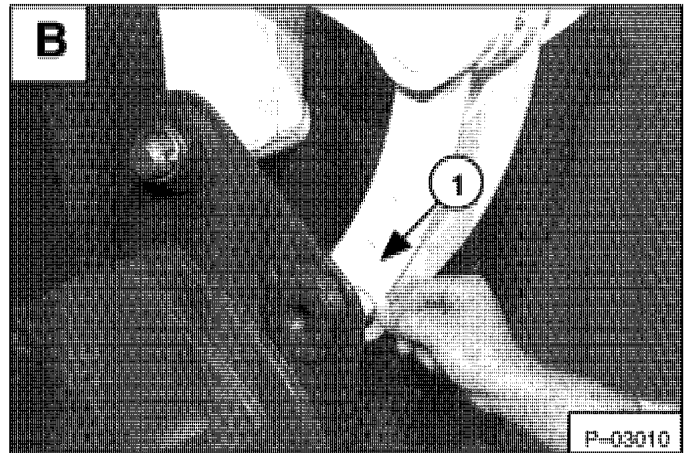
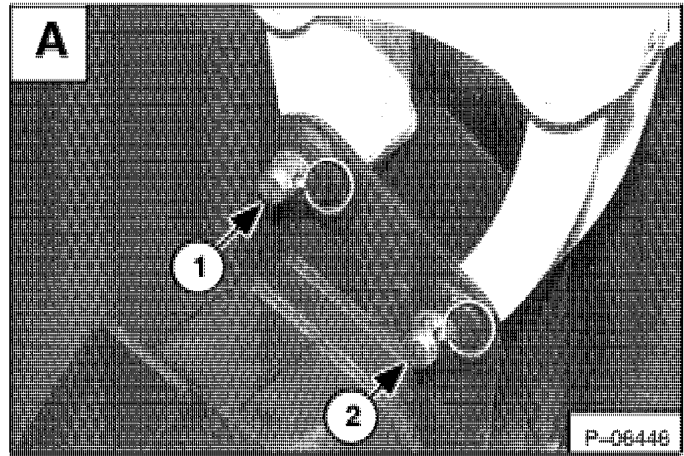
NOTE: Install shims (Item 1) [B] as needed to eliminate any gap between the bucket and the arm and the links.

Install the fasteners. Add grease to the pivot pins before operation.

WARNING

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

W-2052-0100



ATTACHMENTS (Using the X-Change™ System) (If Equipped)

Removal

The X-Change™ is used for fast changing of buckets and attachments.

NOTE: Removal and installation of the bucket is shown. The procedure is the same for all attachments. Disconnect any hydraulic hoses that are connected to the auxiliary couplers before removing any attachments (breaker, auger, etc.).

Select a flat level surface. Put the bucket on the ground. Stop the machine.

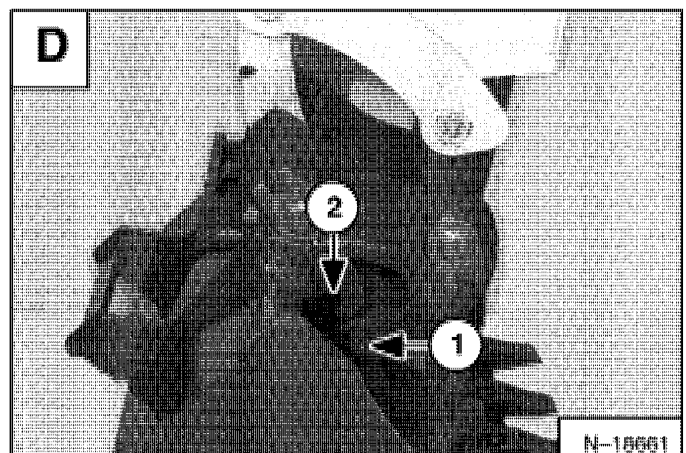
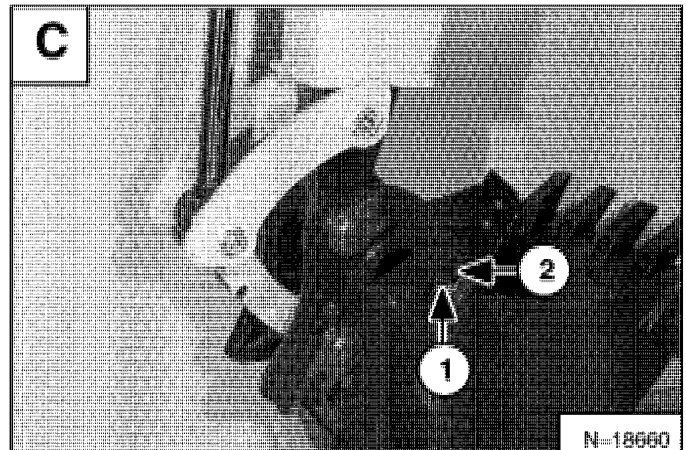
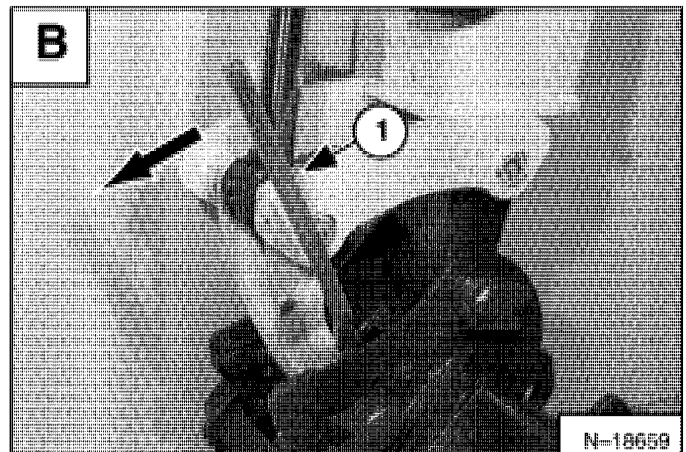
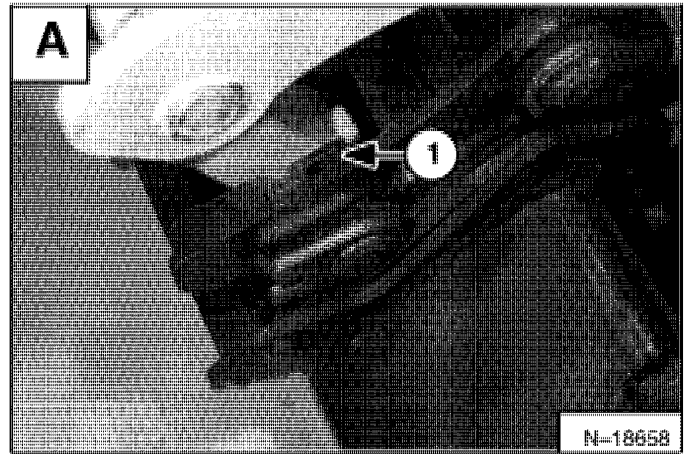
Install the X-Change™ tool in the latch (Item 1) [A].

Pull the lever (Item 1) [B] away from the machine, to unlock the latch. Remove the tool.

Start the machine, lift the boom approximately one foot, and extend the bucket cylinder until the X-Change™ pins (Item 1) [C] engage the hooks (Item 2) [C] on the bucket.

Retract the bucket cylinder and lower the boom and arm until the bucket is on the ground, and the X-Change™ pins (Item 1) [D] are disengaged from the hooks (Item 2) [D].

Move the arm towards the machine until the X-Change™ pins are clear of the bucket.



ATTACHMENTS (Using the X-Change™ System) (If Equipped) (Cont'd)

Installation

! WARNING

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

W-2052-0100

Fully retract the bucket cylinder to release the latch on the X-Change™ [A].

Move the arm towards the bucket.

Raise the boom until the pins (Item 1) [B] engage the hooks (Item 2) [B] on the bucket.

Lift the boom and extend the bucket cylinder until the bucket is in the position shown [C].

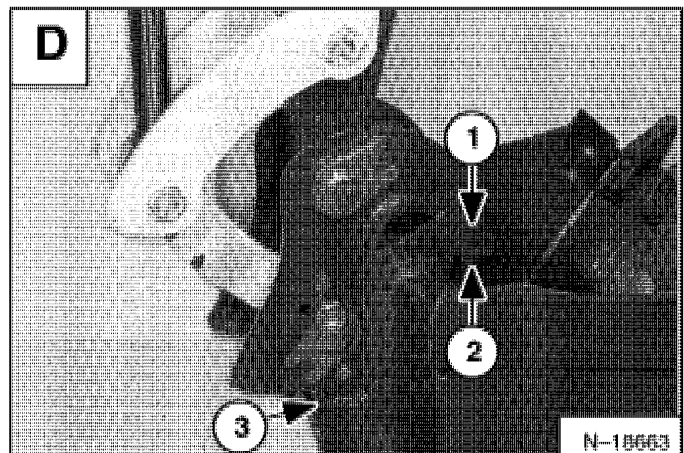
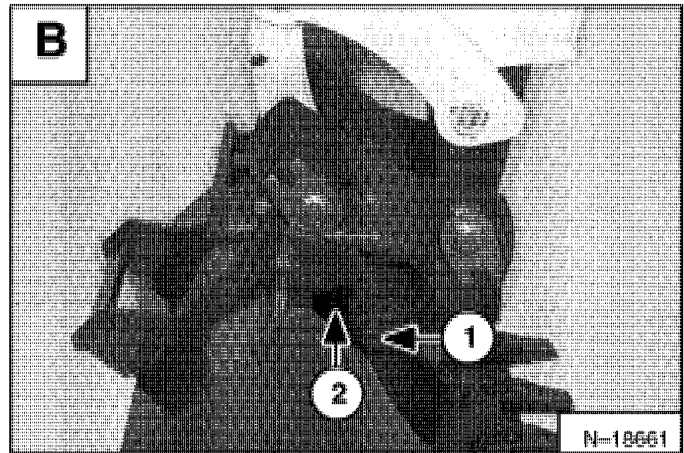
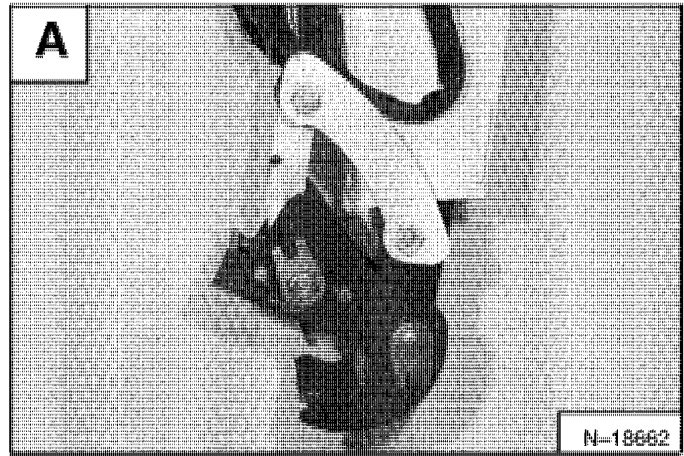
Lower the boom until the hooks (Item 1) [D] of the bucket disengage the pins (Item 2) [D] of the X-Change™ and the plate (Item 3) [D] engages in the bucket crossmember.

! WARNING

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

W-2119-0788

After installation of the bucket, lift the boom approximately three feet and fully extend and retract the bucket cylinder to ensure the bucket is securely attached to the X-Change™.



OPERATING PROCEDURE

Operating On Public Roads

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

Check with utility companies for underground electrical, water, gas lines, etc. Work slowly in areas of underground utilities.

Always warm up 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

Lifting A Load

Do not exceed the rated lift capacity. (See Lift Capacity chart, Page 66.)

Extend the bucket cylinder completely and lower the boom to the ground. Stop the engine.

Wrap the chain assembly around the bucket mounting plate.

Make sure the load is evenly weighted and centered on the lifting chain, and is secured to prevent the load from shifting [A].

Lift and position the load. Once the load is in position and tension is removed from the secondary lift system, remove the secondary lift system from the load.

The optional lifting clamp attachment gives the excavator a wider range of use and mobility for debris removal [B]. (Not available for any Excavator that uses the extendible arm.)

The lifting clamp is operated by the auxiliary hydraulic pedal.

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

The lift capacities are reduced by 110 lbs. (50 kg) if the excavator is equipped with the optional lifting clamp.



WARNING

AVOID INJURY OR DEATH

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

W-2053-0887



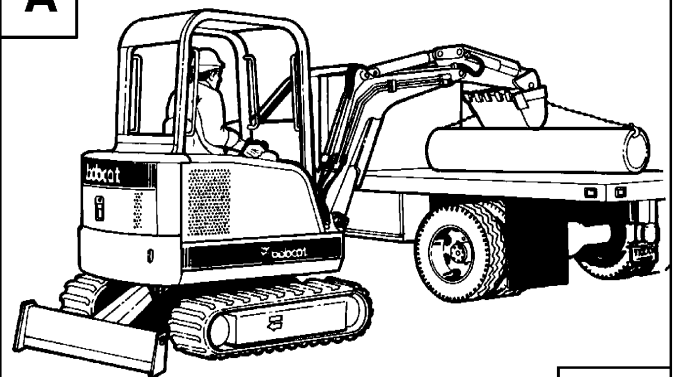
WARNING

AVOID INJURY OR DEATH

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

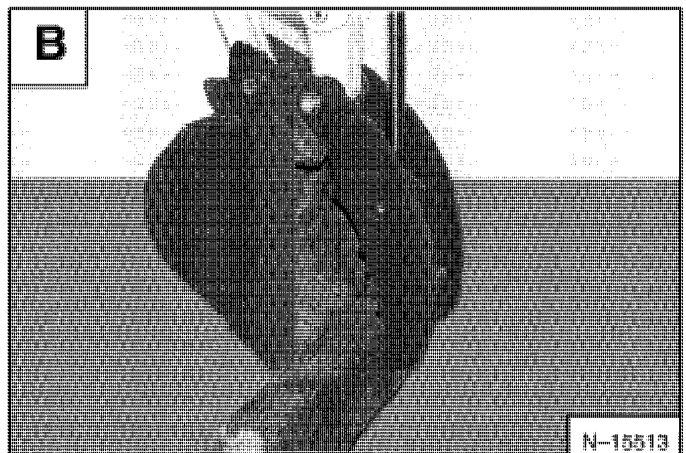
W-2116-1197

A



B-14951

B



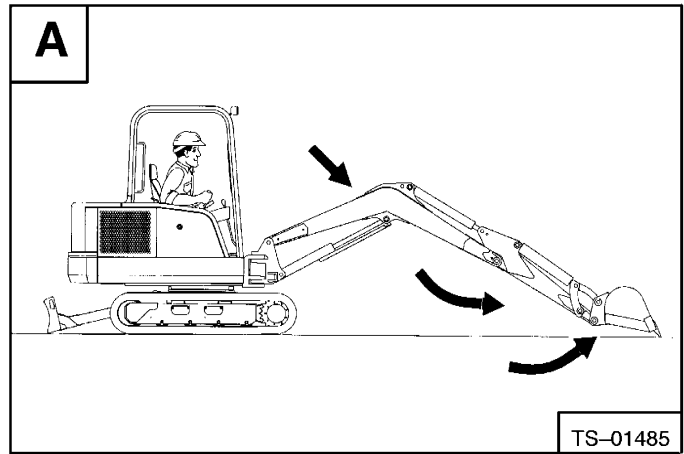
N-15513

OPERATING PROCEDURE (Cont'd)

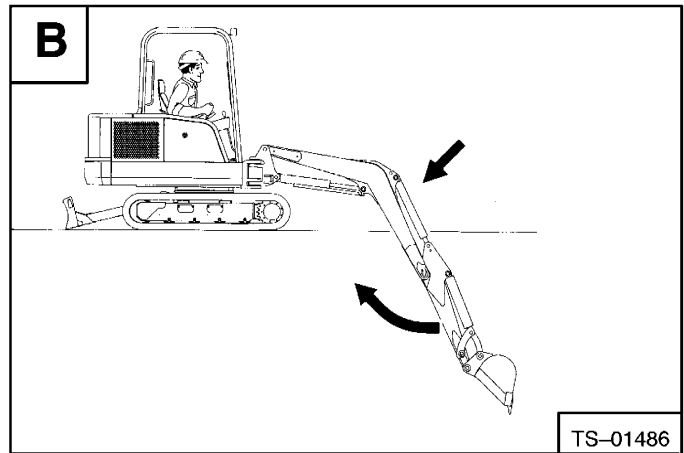
Excavating

Lower the blade to provide machine stability.

Extend the arm, lower the boom and open the bucket [A].



Retract the arm, while lowering boom and curling the bucket [B].



Raise the boom, retract the arm and curl the bucket [C].

Rotate the upperstructure.

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

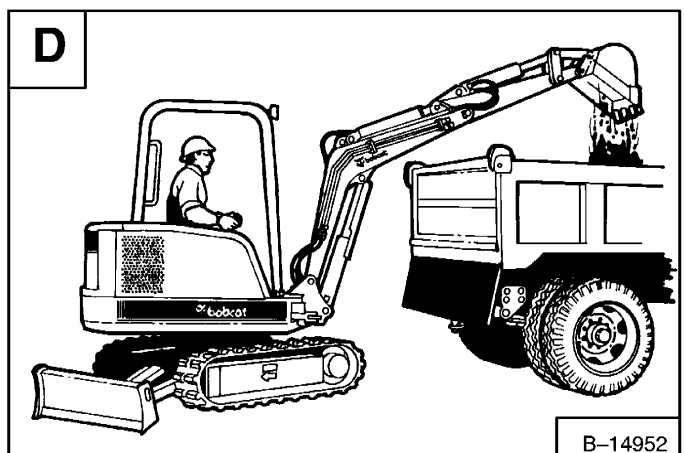
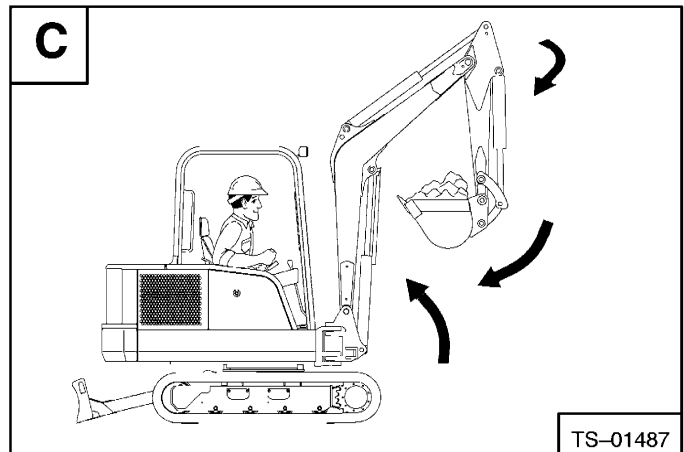


WARNING

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

W-2119-0788

Extend the arm and uncurl the bucket to dump the spoil into a pile or truck [D].



OPERATING PROCEDURE (Cont'd)

Excavating (Cont'd)

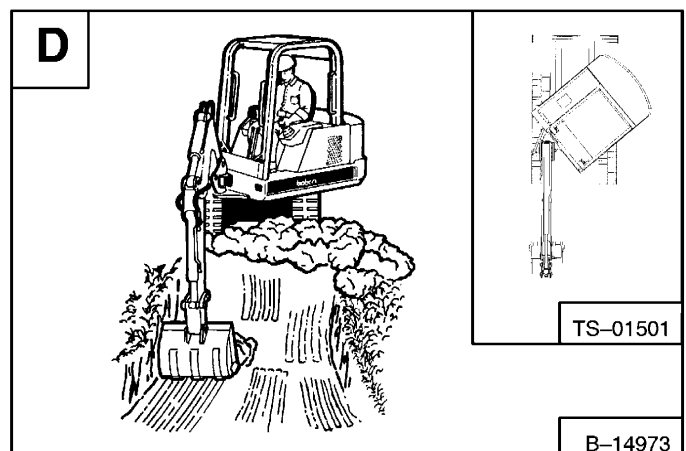
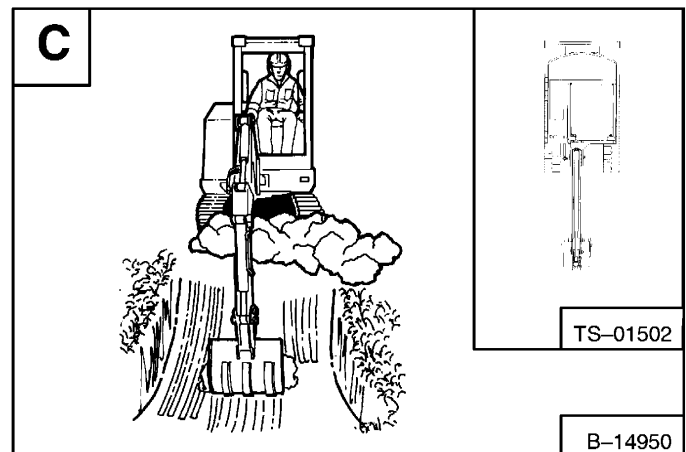
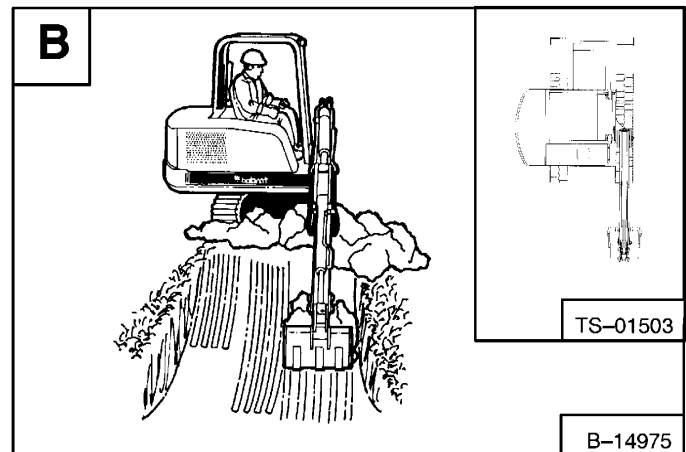
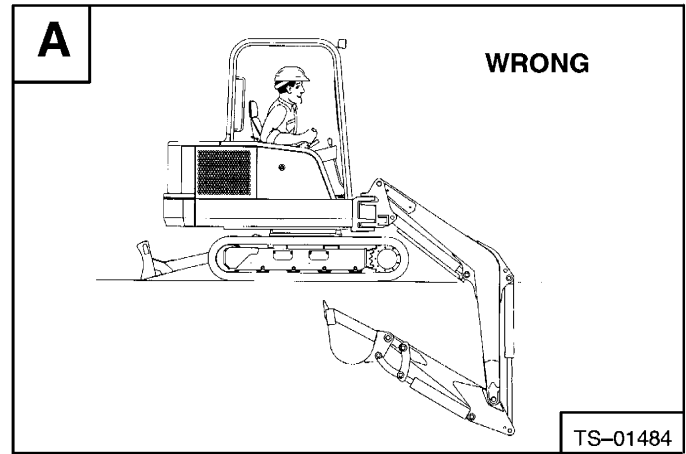
Do not dig under the excavator [A].

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

Do not move the excavator with the bucket in the ground.

Boom Offset

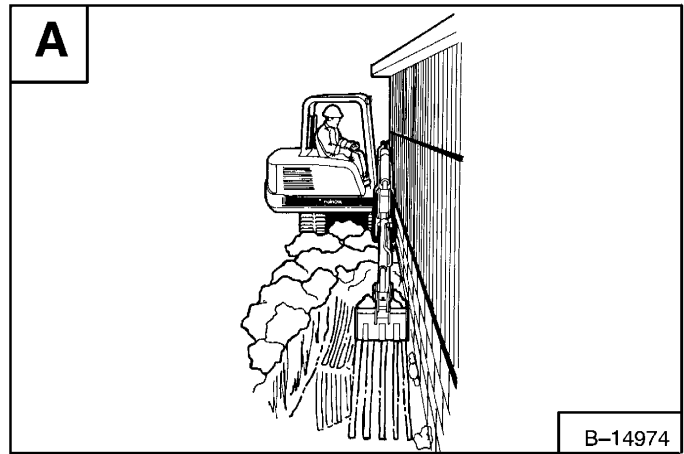
By swinging the upperstructure and offsetting the boom to the left [B], center [C], and right [D] the operator can dig a square hole the width of the machine without repositioning the excavator.



OPERATING PROCEDURE (Cont'd)

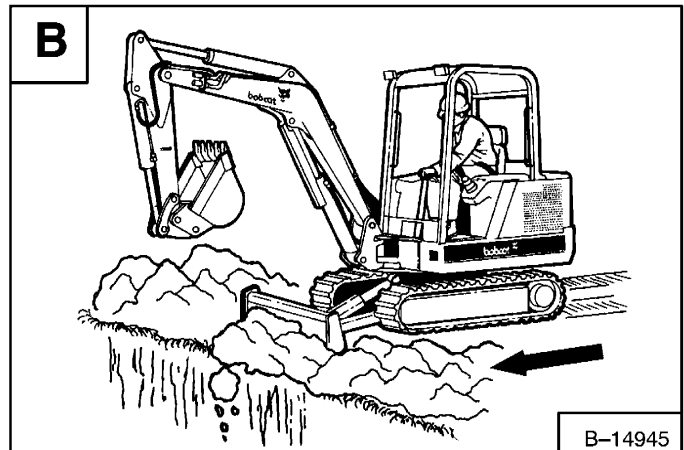
Boom Offset (Cont'd)

The boom offset allows the operator to dig close to buildings and other structures [A].



Back Filling

Use the blade to back fill the trench or hole after the excavating has been done [B].



Driving The Excavator

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

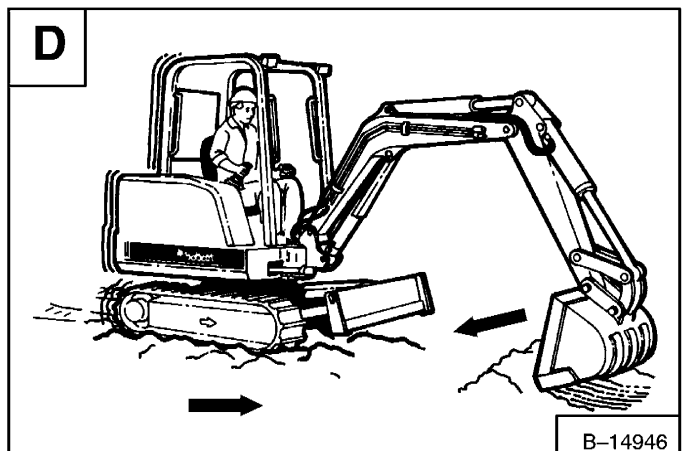
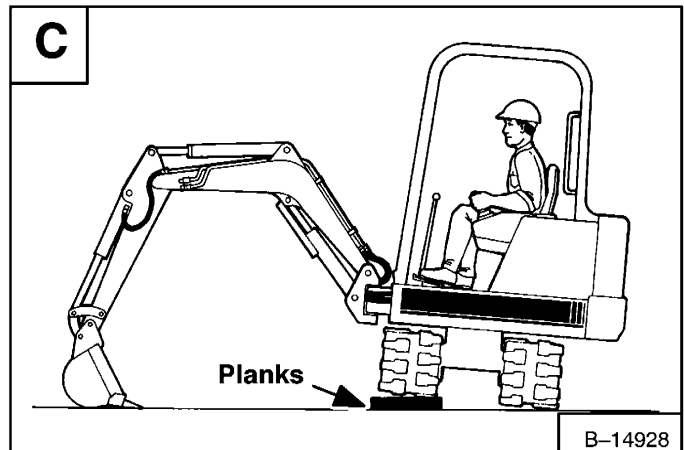
Avoid traveling over objects such as rocks, trees, stumps, etc.

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

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 [C].

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

The bucket may also be used to *pull* the excavator, by extending the arm and lowering the boom as if the operator were going to dig [D].



OPERATING PROCEDURE (Cont'd)

Operating On Slopes

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

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

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

Avoid traveling over objects (such as rocks, trees, stumps, etc.).

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

When traveling up slopes or on side slopes that are 15 degrees or less position the machine as shown and run the engine slow [B].

WARNING

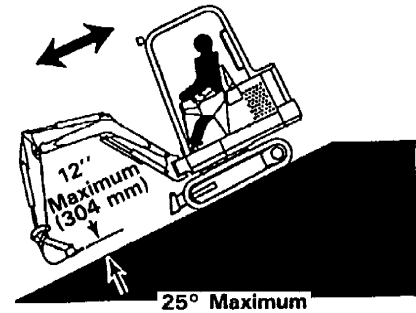
AVOID INJURY OR DEATH

- Do not travel across or up slopes which are over 15 degrees to the side, or to the back of machine or 25 degrees to the front. Keep boom centered while traveling.
- Keep attachments as low as possible when traveling on slopes or in rough conditions.

W-2198-0595

A

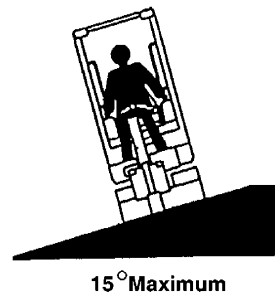
TRAVELING DOWN OR BACKING UP SLOPES



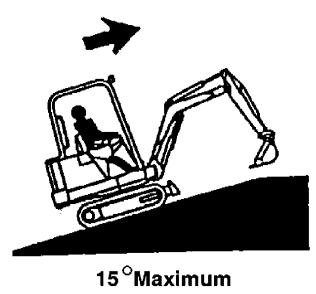
MC-01878B

B

TRAVELING ON SIDE SLOPES



TRAVELING UP SLOPES



MC-01878C

WARNING

AVOID INJURY OR DEATH

- Fasten seat belt, start and operate only from the operator seat.

W-2269-1197

OPERATING PROCEDURE (Cont'd)

Operating On Slopes (Cont'd)

When operating on a slope it is recommended to level the work area [A].

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

Do not work on slopes which are over 15 degrees.

Slow down the work cycle.

Avoid working with the tracks across the slope as this reduces stability and increases the tendency for the machine to slide. Position the excavator with the blade downhill and lowered.

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

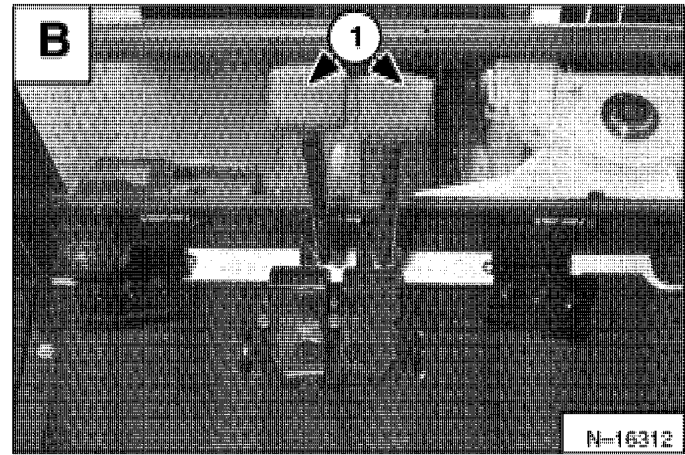
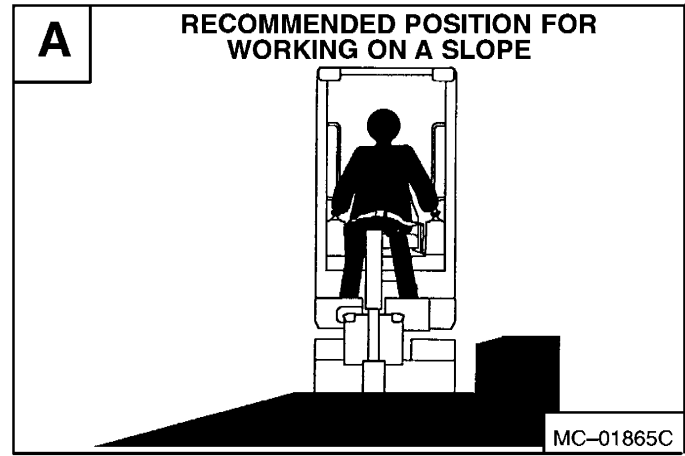
When working with the bucket on the uphill side, keep the bucket as close to the ground as possible. Dump the spoil far enough away from the trench or hole to prevent the possibility of a cave in.

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

NOTE: If the engine stops, the left hand control console must be in the locked down position, and the key switch in the ON position, to activate the accumulator pressure to lower the boom/bucket (attachments) to the ground.

Start the engine and resume the operation.



OPERATING PROCEDURE (Cont'd)

Operating In Water

When operating in water or crossing streams, first check the soil conditions, depth and flow of the water. Never operate in water higher than the bottom of the swing circle [A].

NOTE: Be careful when crossing streams or operating in water, so water does not flood the engine compartment causing engine damage.

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

Properly grease the Excavator when it has been operated or immersed in water for a period of time.

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.

PARKING THE HYDRAULIC EXCAVATOR

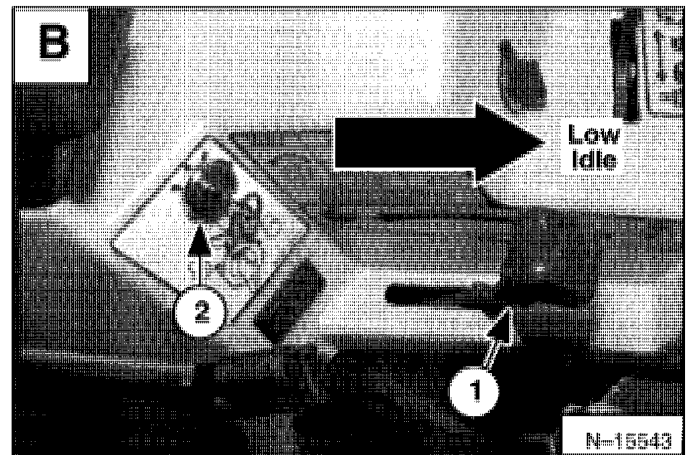
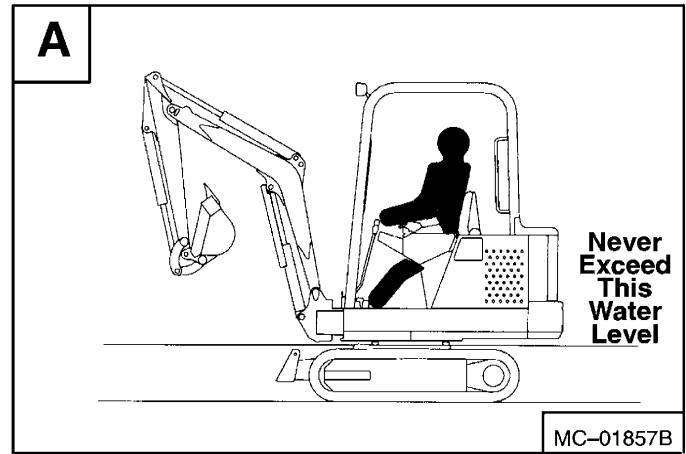
Stop the machine on level ground. Lower the work equipment and the blade to the ground.

Push the speed control (Item 1) [B] lever to the low idle position.

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

Turn the key switch (Item 2) [B] to the OFF position.

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

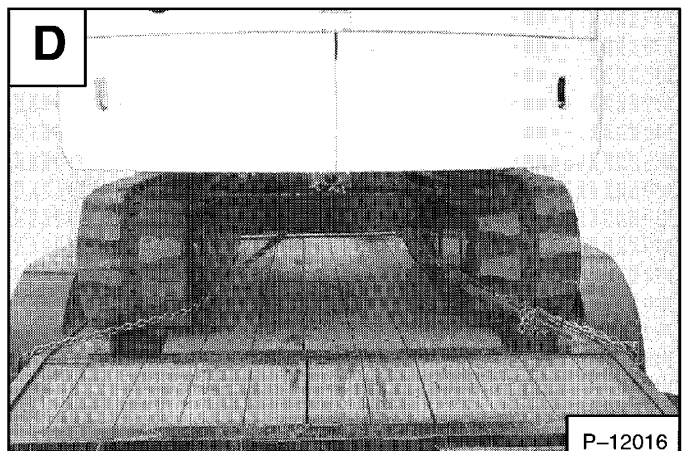
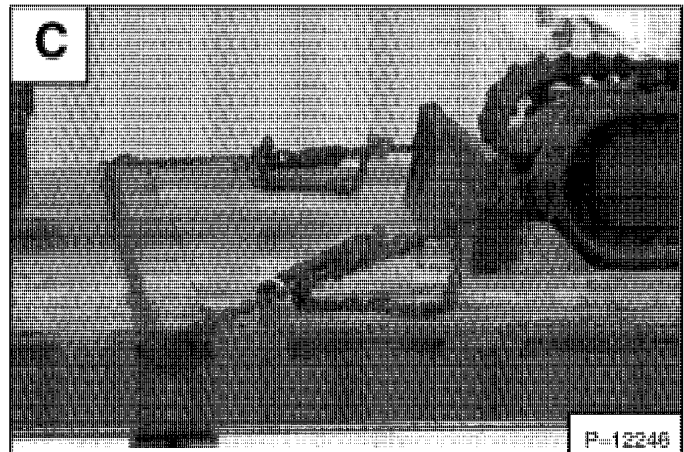
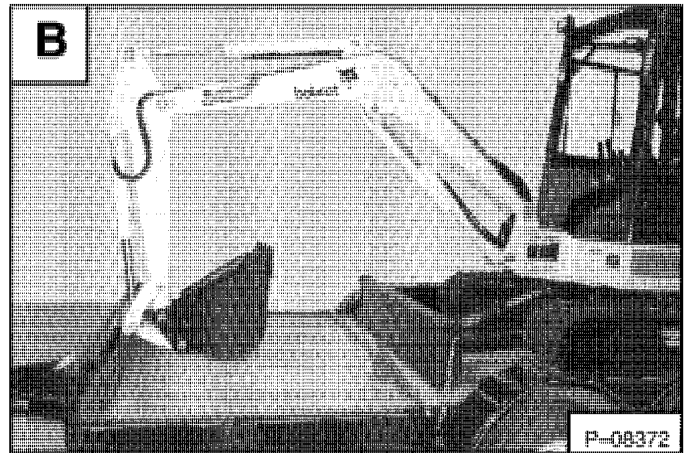
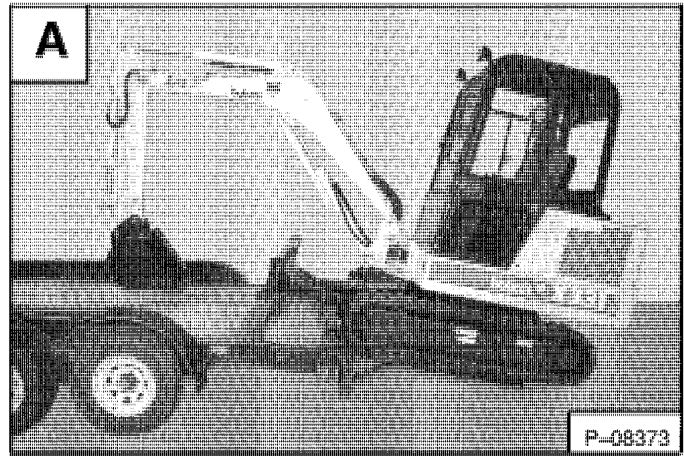


TRANSPORTING THE HYDRAULIC EXCAVATOR

- Make sure the parking brakes on the transport vehicle are engaged and wheels are blocked.
- Align the ramps with the center of the transport vehicle. Secure the ramps to the truck bed and be sure ramp angle does not exceed 15 degrees.
- Use metal loading ramps and slip resistant surface.
- Make sure the ramps are the correct length and width, and can support the weight of the machine.
- The rear of the trailer must be properly blocked or supported when loading or unloading the excavator.
- Retract the extendible arm fully (if equipped) before loading the excavator on the transport vehicle.
- Determine the direction of the track movement before moving the machine (blade forward). Engage the swing lock pin to lock the upperstructure.
- Move the machine forward onto the transport vehicle [A].
- Do not change direction of the machine while it is on the ramps.
- After loading the machine, position the arm and bucket as shown [B].
- Lower the boom.
- Stop the engine and remove the key.

Use the following procedure to fasten the Excavator to the transport vehicle:

- Put blocks under the front and rear of the track shoes.
- Fasten holddown chains to the front corners of the blade and to the tie down loop at the track frame prevent it from moving when going up or down slopes, or during sudden stops [B], [C] & [D].
- Use chain binders to tighten the chains and then safety tie the chain binder levers to prevent loosening.
- 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.



WARNING

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-2058-0494

LIFTING THE HYDRAULIC EXCAVATOR

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

Put the control levers in neutral and engage the swing locking lever.

WARNING

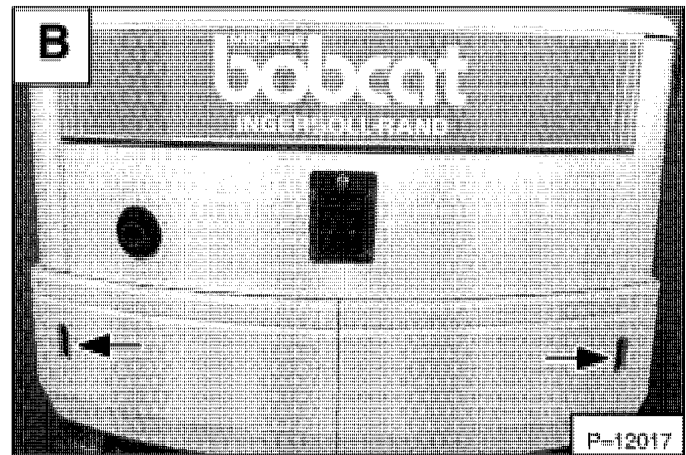
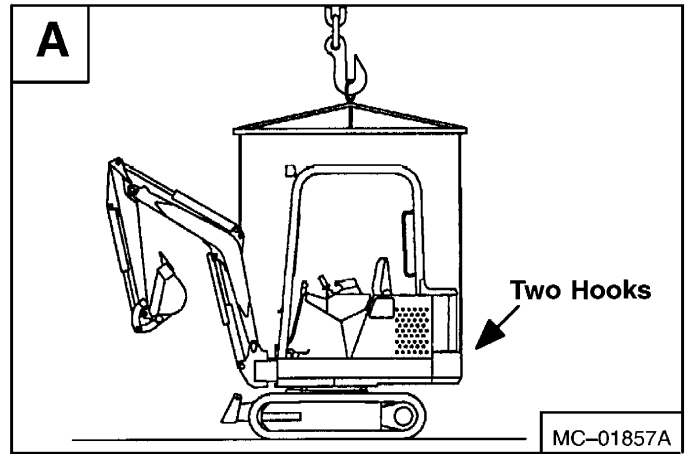
AVOID INJURY OR DEATH

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

W-2202-0595

Secure the lifting fixture sling to the lifting holes at the left and right side at the rear of the frame and the lift eye on the boom [A] & [B].

Install a spreader bar above the cab/canopy to prevent lifting fixture from rubbing on the cab/canopy or the rear engine cover.





PREVENTIVE MAINTENANCE

AIR CLEANER SERVICE	40
ALTERNATOR BELT ADJUSTMENT	46
COOLING SYSTEM	
Coolant Level	45
Coolant Replacement	45
ELECTRICAL SYSTEM	
Electrical Relays and Diodes	46
Electric Solenoid (Engine Stop)	50
Fuses	46
Removal And Installation of the Battery	50
Service The Electrical System (and Battery)	47
Using A Booster Battery (Jump Starting)	49
ENGINE COVER	
Adjustment Of The Engine Cover Latch	40
Opening The Engine Cover	40
ENGINE LUBRICATION SYSTEM	
Checking Engine Oil	44
Replacement Of Oil And Filter	44
FUEL SYSTEM	
Filling The Fuel Tank	42
Fuel Filter	42
Fuel Specifications	43
Fuel System Maintenance	43
Removing Air From The Fuel System	43
HEATER AIR FILTER (With Cab Option Only)	61
HYDRAULIC SYSTEM	
Checking And Adding Fluid	51
Diagnostic Couplers	51
Replacing The Drain Line Filter	52
Replacing The Hydraulic Filter	52
Replacing The Hydraulic Oil	52
JOYSTICK CONTROL CHANGE	
ISO To Standard Control Pattern	56
Standard To ISO Control Pattern	56
LUBRICATION OF THE HYDRAULIC EXCAVATOR	58
MAINTENANCE SAFETY	38
SERVICE SCHEDULE	39
SPARK ARRESTOR MUFFLER	53
TRACK TENSION	
Adjustment	54
Rubber Tracks	54
Steel Tracks	55
TRAVEL MOTOR	
Checking Oil Level	56
Draining And Refilling	56

PREVENTIVE MAINTENANCE

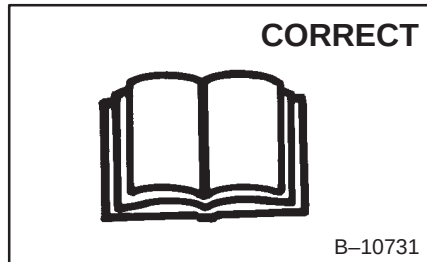
MAINTENANCE SAFETY

WARNING

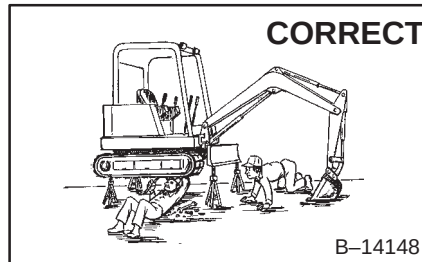
Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments,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

W-2003-0199

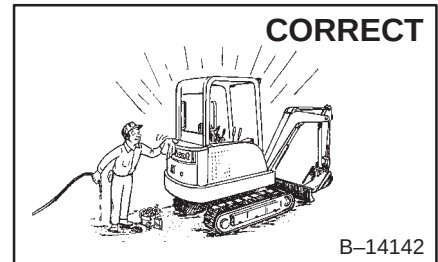
 **Safety Alert Symbol:** This symbol is used for important safety messages. When you see this symbol, follow the safety message to avoid personal injury or death.



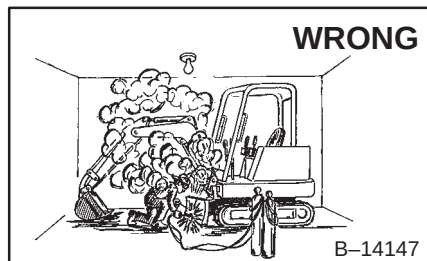
 **Never service the Bobcat Hydraulic Excavator without instructions.**



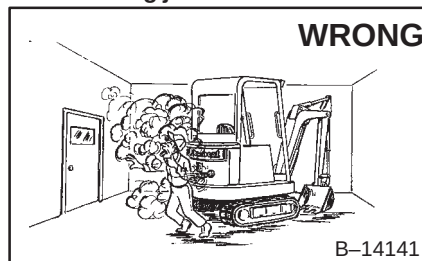
 **Use the correct procedure to lift and support the excavator. Always lift the blade fully before installing jackstands.**



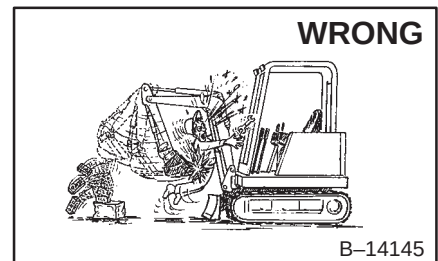
 **Cleaning and maintenance are required daily.**



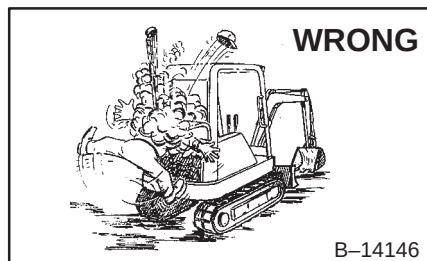
 **Have good ventilation when welding or grinding painted parts.**
 **Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.**



 **Vent exhaust to outside when engine must be run for service.**
 **Exhaust system must be tightly sealed. Exhaust fumes can kill without warning.**



 **Always lower the bucket and blade to the ground before doing any maintenance.**
 **Never modify equipment or add attachments not approved by Bobcat Company.**



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



 **Keep body, jewelry and clothing away from moving parts, electrical contacts, 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 protection approved for type of welding.**
 **Keep rear door closed except for service. Close and latch door before operating the excavator.**



 **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 this manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL**. Always use **genuine Bobcat replacement parts**.

MSW20-0500

SERVICE SCHEDULE

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 Hydraulic Excavator.



WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, 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-2003-0199

SERVICE SCHEDULE		HOURS					
ITEM	SERVICE REQUIRED	8-10	50	100	250	500	1000
Engine Air Cleaner	Replace the filter element only when the red ring shows in the indicator window. Check for leaks and damaged components.						
Engine Oil	Check the oil level and add oil as needed.						
Engine Coolant System	Check coolant level in recovery tank.						
Indicator Lights	Check for correct operation.						
Operator Cab	Check the fastening bolts, nuts, and condition of cab/canopy.						
Seat Belt	Check the condition and that fasteners are tight.						
Safety Signs (Decals)	Check for damaged signs (decals) replace as needed.						
Tracks	Check and adjust tension.						
All Machinery Pivot Points	Lubricate 25 grease fittings.						
Hyd. Fluid, Hoses and Tubelines	Check fluid level and add as needed. Check for damage and leaks. Repair and replace as needed.						
Extendible Arm (If Equipped)	Lubricate slide on extendible arm						
Fuel Tank/Fuel Filter	Drain water and sediment from fuel tank/fuel filter.						
Swing Circle	Lubricate two grease fittings.						
Swing Pinion	Lubricate one grease fitting.						
Battery	Check cables, connections and electrolyte level. Add distilled water as needed.						
Spark Arrestor Muffler	Clean spark chamber.						
Alternator/Fan Belt	Check and adjust tension.		*				
Engine Oil and Filter	Replace oil and filter element.		*				
Travel Motor	Check fluid level and add oil as needed.						
Fuel Filter	Replace filter element.						
Cooling System	Clean the radiator fins.						
Alternator and Starter	Check the condition.						
Hydraulic Filter	Replace filter element.			**			
Drain Return Line Filter	Clean filter with solvent, dry with air pressure.			**			
Engine Valve Clearance	Check and adjust as needed						
Cooling System	Drain, flush and add new coolant to the cooling system.						
Hydraulic Tank	Change the fluid, clean fill neck strainer.						
Travel Motor	Change the oil.			**			
Cab Heater Air Filter	Clean the filter.						

***After the first 50 hours of machine operation do the following:**

Replace the engine oil and filter.

Check the condition of the alternator/fan belt.

****After the first 100 hours of machine operation do the following procedures:**

Change oil in the travel motor.

Clean drain return line filter.

Replace hydraulic filter.

■ Or Every 12 Months.

ENGINE COVER

Opening The Engine Cover



WARNING

AVOID INJURY

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

W-2012-0497

Keep the engine cover closed when operating the machine.

W-2141-0189

Open the engine cover to service the engine. Pull on the latch and lift the engine cover up until it is fully raised [A].

Adjustment Of The Engine Cover Latch

Open the engine cover.

Loosen the nuts (Item 1) [B] and adjust the stop (Item 2) [B]. Tighten the nuts (Item 1) [B] when the stop (Item 2) [B] is in the correct position.

Loosen the two bolts (Item 3) [B] and adjust the striker plate (Item 4) [B] until it is in the correct position. Tighten the two bolts (Item 3) [B].

AIR CLEANER SERVICE

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

Check the air intake hose for damage. Check the air cleaner housing for damage. Check to make sure all connections are tight.

Replace the large (outer) filter element only when the red ring shows in the window of the condition indicator (Item 1) [C].

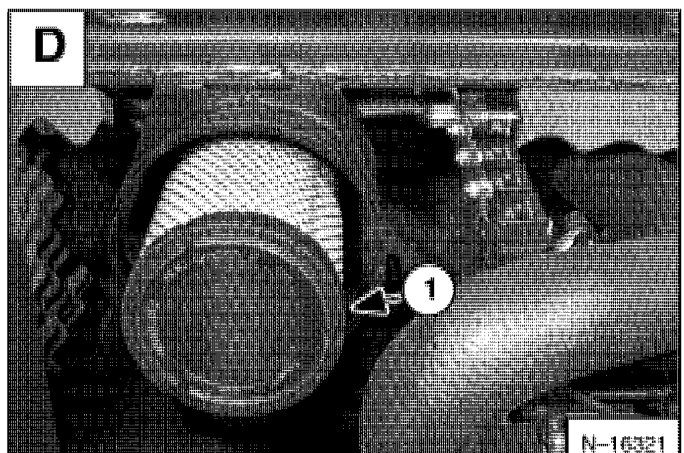
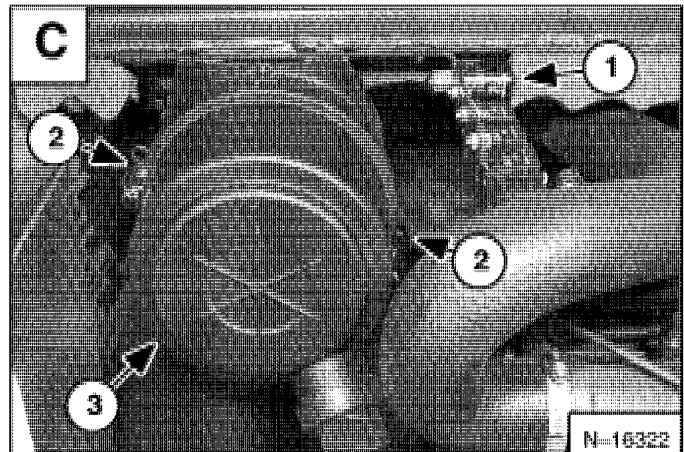
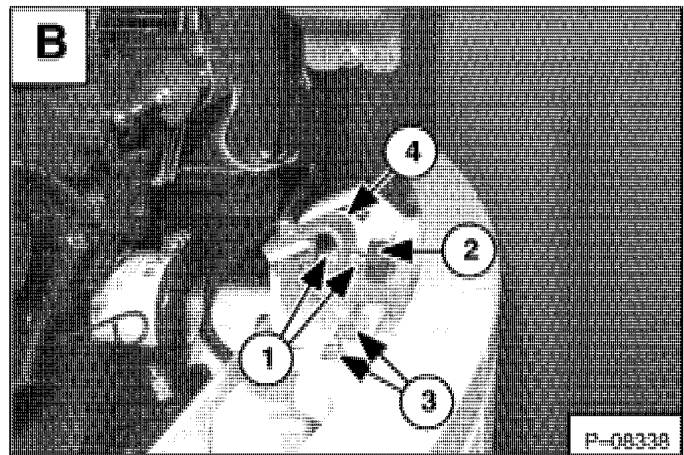
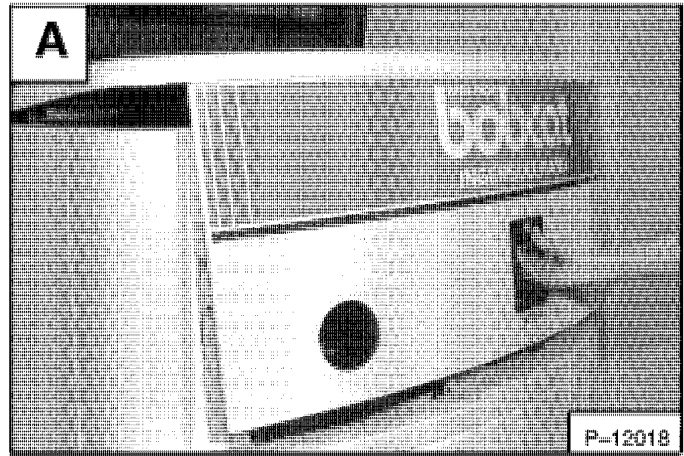
NOTE: Push the button on the condition indicator (Item 1) [C] and start the engine. If the red ring does not show, do not replace the filter element.

Service the air cleaner as follows:

Remove the dust cover clamps (Item 2) [C].

Remove the dust cover (Item 3) [C].

Remove the large air filter element (Item 1) [D].



AIR CLEANER SERVICE (Cont'd)

Install the new filter element. Install the dust cover and latch the two clamps.

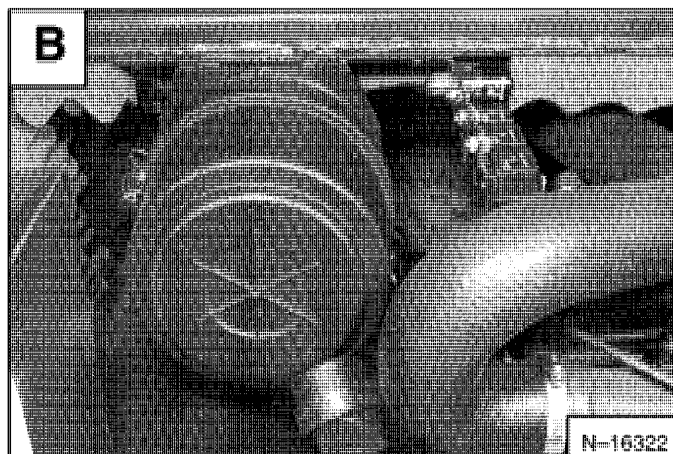
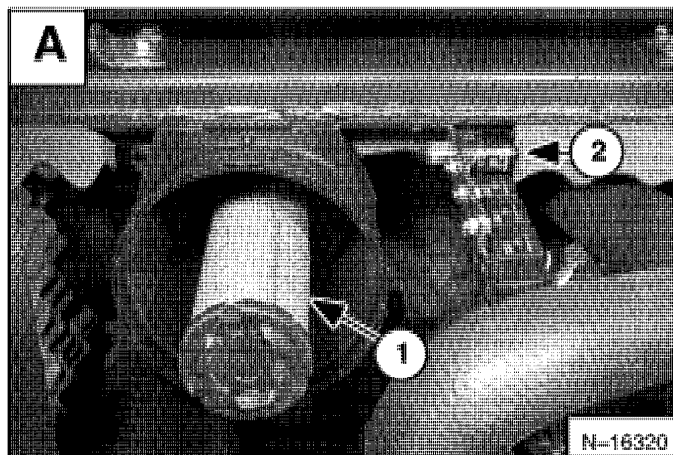
NOTE: Make sure all sealing surfaces are free of dirt and debris.

Only replace the inner filter element (Item 1) [A] under the following conditions.

- Replace the inner filter element every third time the outer filter element is replaced.
- Replace the inner filter element when the red ring still shows in the condition indicator window after the outer filter element is replaced.

NOTE: After replacing the primary (large) filter element, recheck the condition of the inner filter element by pushing the button on the condition indicator (Item 2) [A] and start the engine. Run the engine at full throttle. If the red ring on the condition indicator shows, replace the inner filter element.

Install the dust cover as shown [B].



FUEL SYSTEM

Filling The Fuel Tank

! WARNING

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

W-2063-0887

The fuel level in the tank is indicated by the fuel gauge (Item 1) [A] when the ignition switch is ON.

NOTE: When the fuel level reaches approximately the 2.5 gals. (9,3 L.) fuel level, the low fuel light (Item 2) [A] will come ON to alert the operator of this condition.

Use the key to unlock the fuel fill door [B].

Turn the fuel cap to remove it [C].

Use a clean, approved safety container to add fuel to the tank.

Add fuel only in an area that has a free movement of air and no flames or sparks. **NO SMOKING!**

After the tank is full, install and tighten the fuel cap. Close and lock the fuel door.

! WARNING

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 which can result in injury or death.

W-2103-1285

Fuel Filter

See the *SERVICE SCHEDULE* Page 39 for the service interval when to replace the fuel filter.

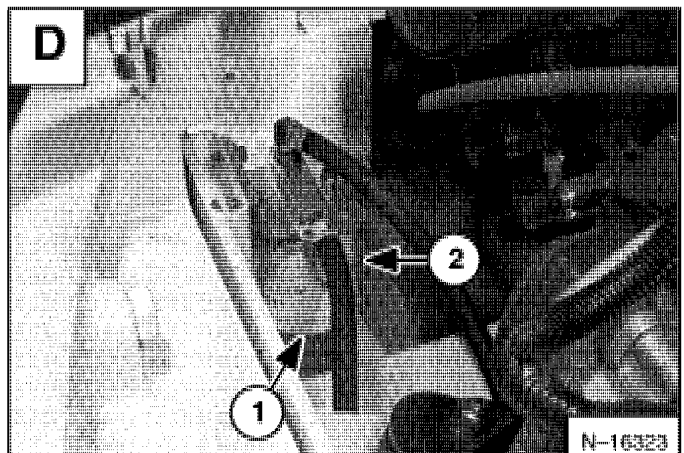
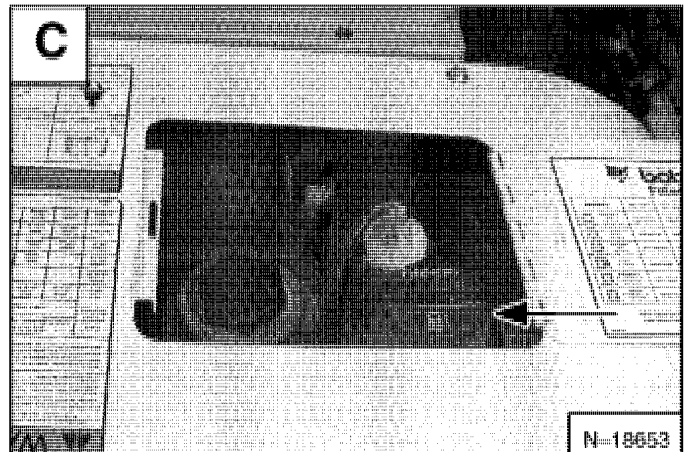
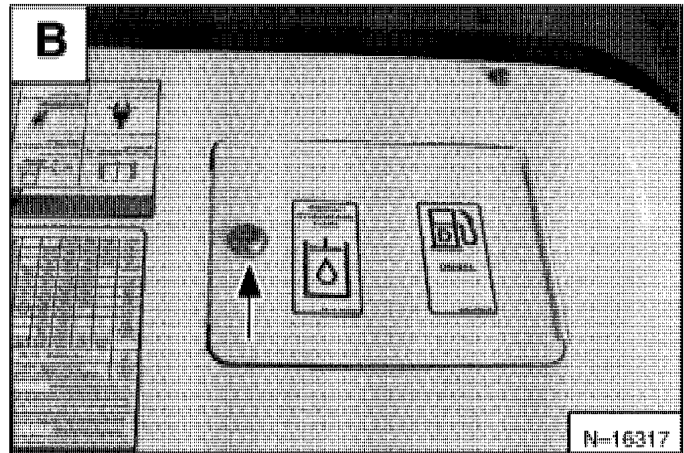
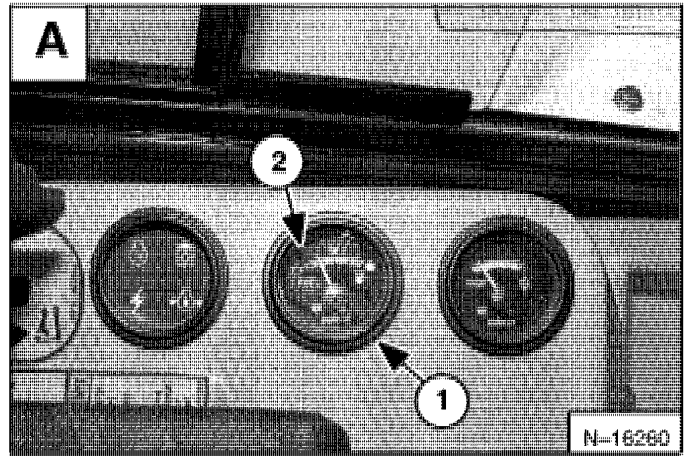
Loosen the drain (Item 1) [D] at the bottom of the filter element to drain any water from the fuel filter.

Tighten the drain when all the water has been removed.

Remove the filter element (Item 2) [D].

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

Remove the air from the fuel filter.



FUEL SYSTEM (Cont'd)

Fuel System Maintenance

See the *SERVICE SCHEDULE* Page 39 for the correct service intervals.

To remove water and sediment from the fuel tank, turn the upperstructure until the fuel tank is centered between the rear tracks.

Open the drain valve (Item 1) **[A]** at the bottom of the fuel tank.

Drain contaminated fuel into a container.

Removing Air From The Fuel System

After replacing the fuel filter or when the fuel tank has run out of fuel, the air must be removed from the fuel system before starting the engine.

Open the vent (Item 1) **[B]** on the fuel filter housing.

Operate the hand pump (priming bulb) (Item 1) **[C]** until the fuel flows from the vent with no air bubbles.

Tighten the vent.

Start the engine. It may be necessary to open the vent (Item 2) **[C]** at the fuel injection pump briefly until the engine runs smoothly.

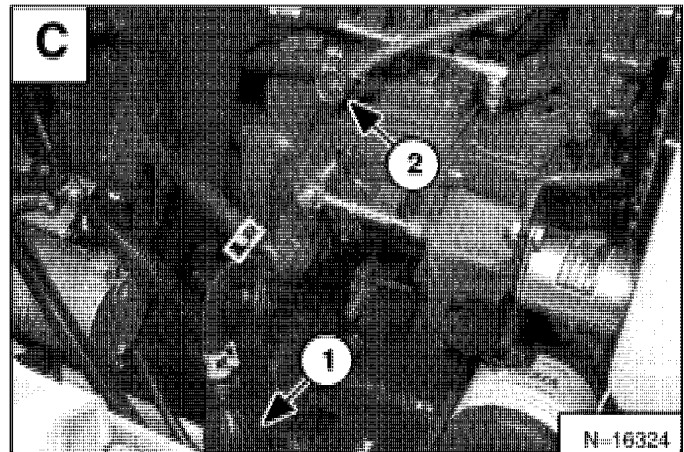
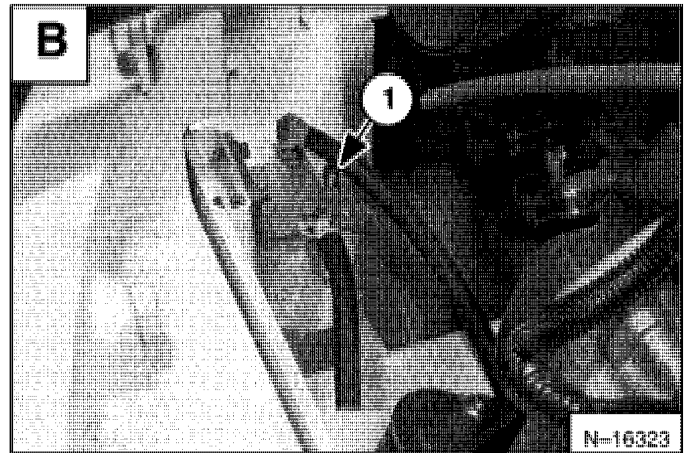
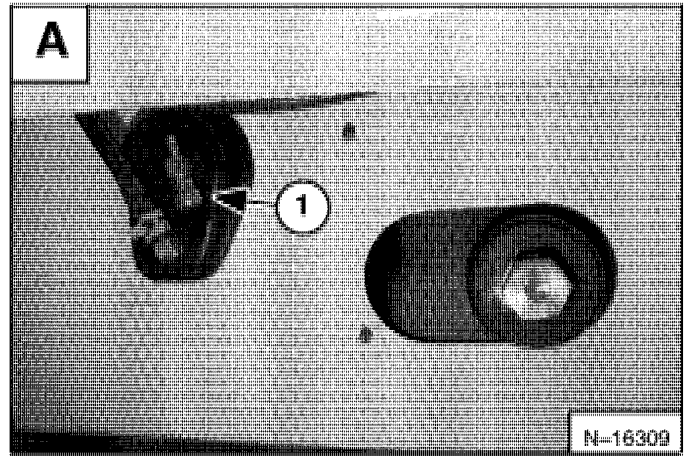
Fuel Specifications

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

The following is suggested blending guideline which should prevent fuel gelling problems.

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

For local recommendations, the operator can contact his fuel supplier.



WARNING

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 which can result in injury or death.

W-2103-1285

ENGINE LUBRICATION SYSTEM

Checking Engine Oil

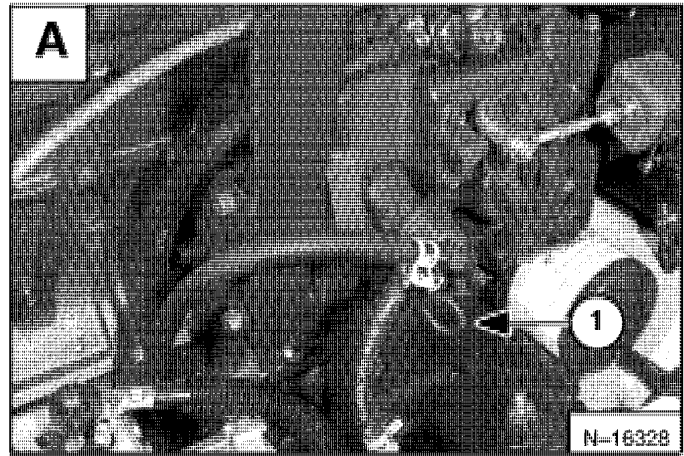
Check the engine oil every day.

Stop the engine. Open the rear cover.

Remove the dipstick (Item 1) [A].

Keep the oil level between the marks on the dipstick.

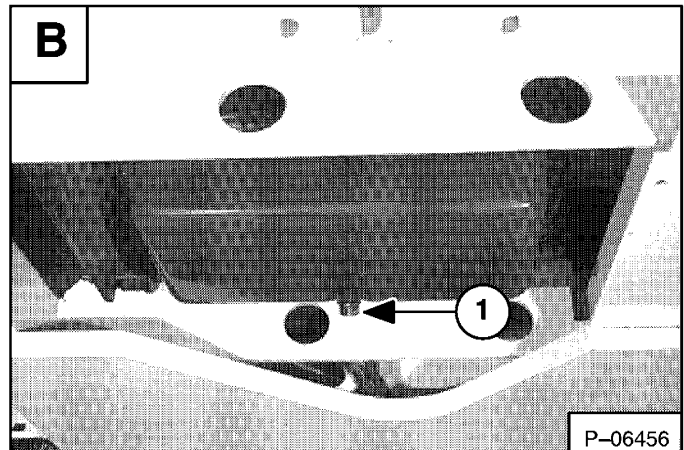
Use a good quality motor oil that meets the correct API Service Classification. (See *FUEL, COOLANT AND LUBRICATION Chart*, Page 92.)



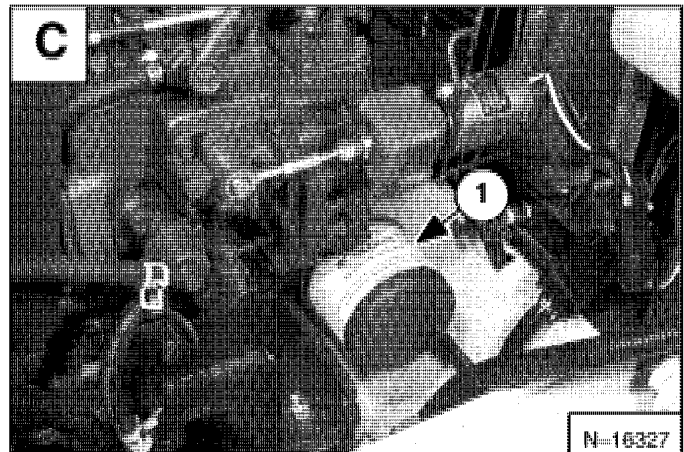
Replacement Of Oil And Filter

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

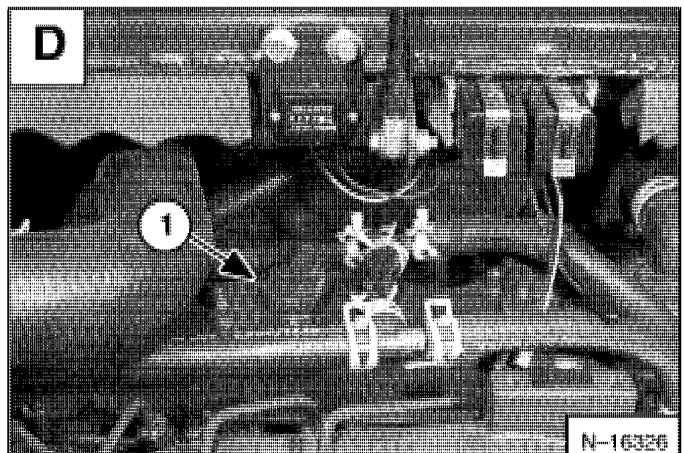
1. Run the engine until it is at operating temperature. Stop the engine.
2. Open the rear cover.
3. Remove the drain plug (Item 1) [B] from the oil pan. Drain the oil into a container.



4. Remove the oil filter (Item 1) [C], using a filter wrench.
5. Clean the filter housing surface. Put clean oil on the filter gasket. Install the new filter and hand tighten only.
6. Install and tighten the oil drain plug.



7. Remove the oil fill cap (Item 1) [D]. Put in 7.5 qts. (7,1 l.) of oil into the engine. (SEE *FUEL, COOLANT AND LUBRICANTS Chart*, Page 92.)
8. Start the engine and let it run for several minutes. Stop the engine. Check for leaks at the oil filter and the oil drain plug.
9. Check the oil level and add oil as needed if it is not at the top mark on the dipstick.



COOLING SYSTEM

Coolant Level



WARNING

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

W-2070-1285

When the engine is cool, the coolant level in the recovery tank (Item 1) **[A]** must be half full.

If the coolant level is low, add premixed coolant to the recovery tank (See type of coolant information below).

Coolant Replacement

See the *SERVICE SCHEDULE* Page 39 for the correct service intervals.

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

When the engine is cool, loosen and remove the radiator cap (Item 2) **[A]**.

Open the radiator drain valve (Item 1) **[B]** at bottom of radiator. Drain the coolant into a container.

Open the engine block drain valve (Item 2) **[B]** and drain the coolant into a container.

After all the coolant is removed, close both drain valves.

Remove all coolant from the coolant recovery tank (Item 1) **[A]** also.

Mix the coolant in a separate container. (SEE *FUEL, COOLANT AND LUBRICANTS Chart*, Page 92, for correct capacity).

NOTE: The excavator is factory filled with propylene glycol. DO NOT mix propylene glycol with ethylene glycol.

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

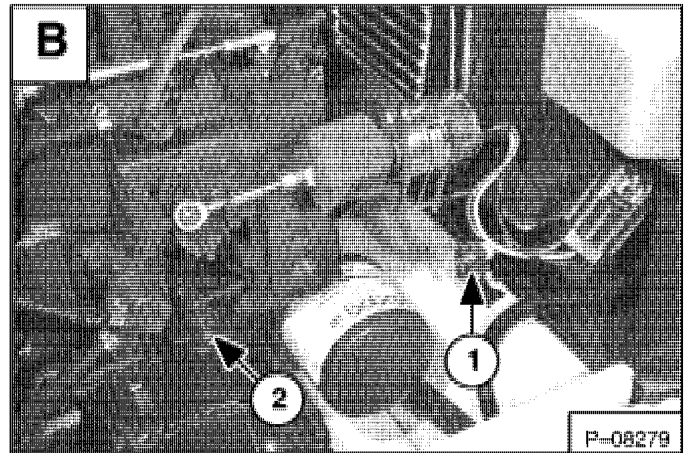
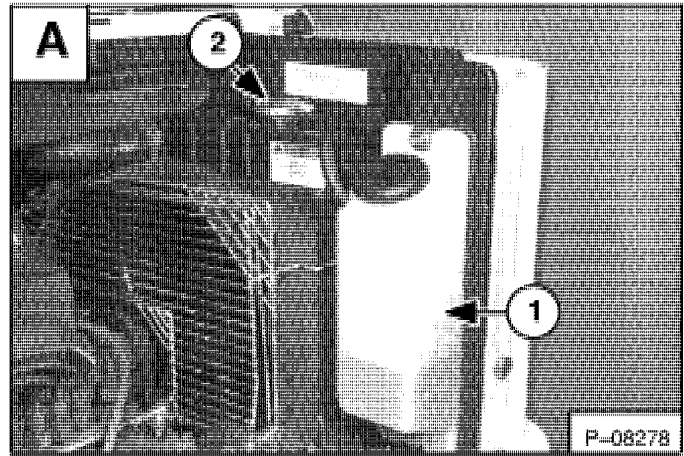
One gallon and one pint of propylene glycol mixed with one gallon of water is the correct mixture of coolant to provide a -34°F (-37°C) freeze protection.

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

Fill the radiator with the premixed coolant until it is full. Add coolant to the recovery tank until it is half full.

Run the engine at idle speed for about 5 – 10 minutes to remove the air from the cooling system (leave the radiator cap off during this operation).

Stop the engine. Check the coolant level and add as needed to bring it up to the radiator filler neck. Install the radiator cap and tighten.



IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to anti-freeze.

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

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

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

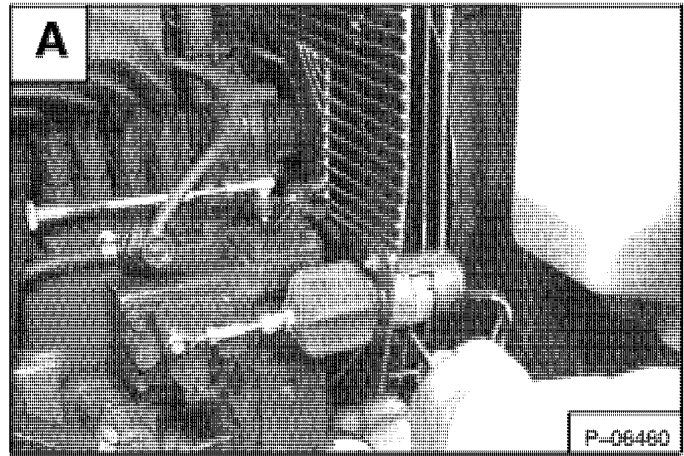
I-2124-0497

ALTERNATOR BELT ADJUSTMENT

To adjust the belt tension, use the following procedure:

Stop the engine. Open the engine cover.

The belt should deflect about 1/2 inch (13 mm) when pressed between the water pump pulley and crankshaft pulley with approximately 13 lbs. (58 Nm) pressure [A].



If the tension is not correct, remove the seat and seat mount. (See Service Manual):

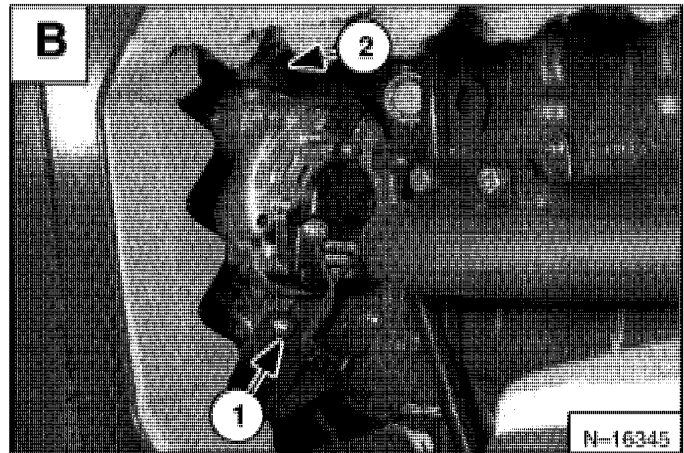
Loosen the alternator mounting bolt (Item 1) [B].

Loosen the alternator adjustment bolt (Item 2) [B].

Move the alternator until the belt tension is correct.

Tighten the adjustment bolt and mounting bolt.

Replace the belt if it has stretched or there are cracks in the belt. Check the pulley grooves, make sure the belt is not in contact with the bottom of the grooves in the pulleys.



ELECTRICAL SYSTEM

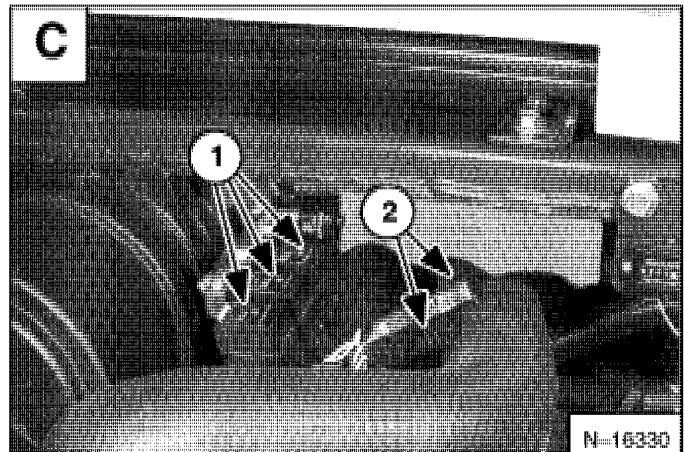
The excavator has a 12 volt, negative ground electrical system.

Electrical Relays And Diodes

The engine harness electrical relays (Item 1) [C] and the diodes (Item 2) [C] are located in the engine compartment to the right of the air cleaner.

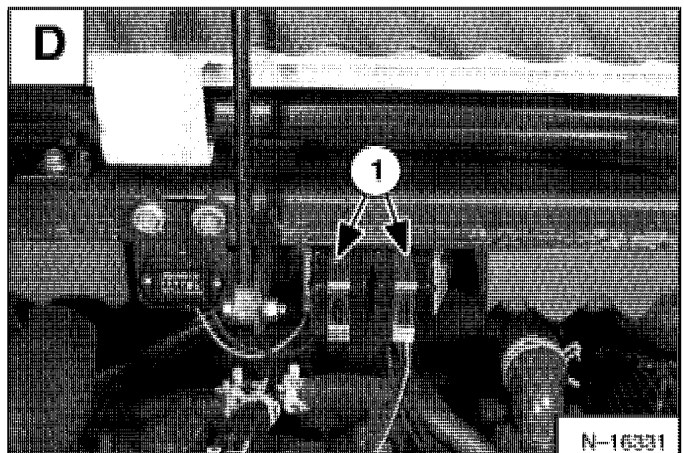
The three relays (Item 1) [C] control the starter, glow plugs and switched power.

The two diodes (Item 2) [C] are for alternator feedback protection and the glow plug during start function.



Fuses

The fuses are located in the engine compartment. Remove the two fuse block covers (Item 1) [D].



ELECTRICAL SYSTEM (Cont'd)

Fuses (Cont'd)

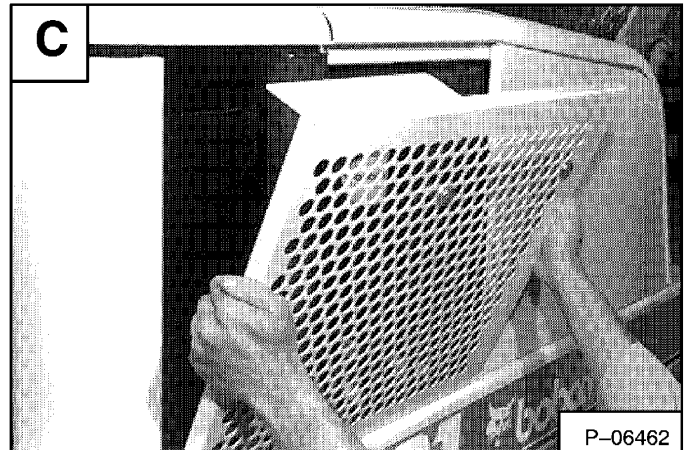
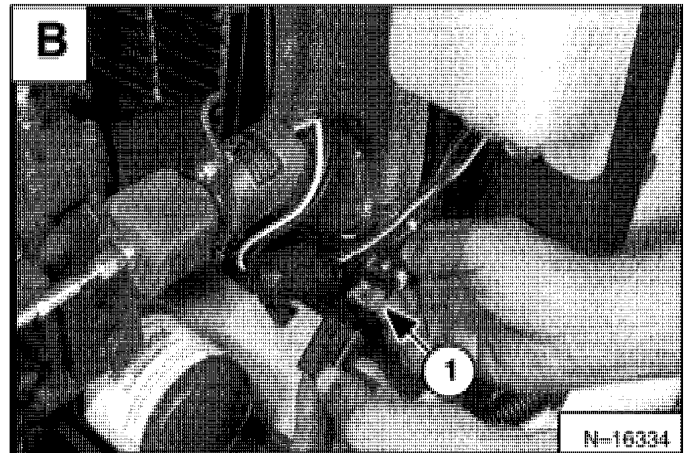
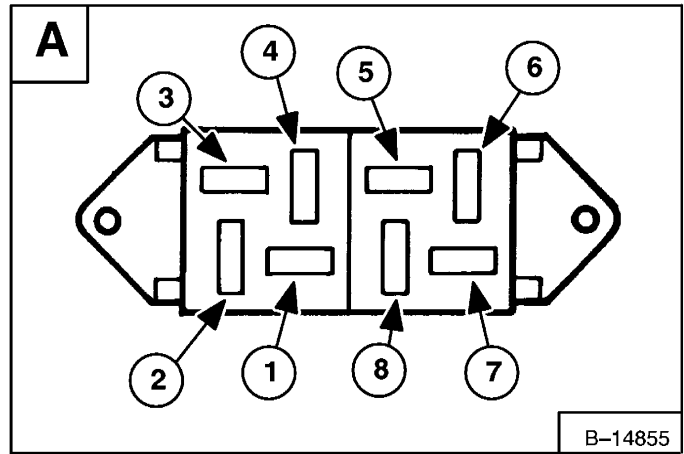
1. **FUSE** – 10 AMP: This fuse supplies power to the instrument circuit [A].
2. **FUSE** – 10 AMP: This fuse supplies power to the timer solenoid [A].
3. **FUSE** – 20 AMP: This fuse supplies power to the start circuit [A].
4. **FUSE** – 15 AMP: This fuse supplies power to cab wiring (if equipped) [A].
5. **FUSE** – 15 AMP: This fuse supplies power to any accessory that has constant power [A].
6. **FUSE** – 20 AMP: This fuse supplies power to the horn and heater motor (if equipped) [A].
7. **FUSE** – 5 AMP: This fuse supplies power to the optional wiper motor [A].
8. **FUSE** – 20 AMP: This fuse supplies power to the lights, and any future functions and/or attachments [A].

The fuse (Item 1) [B] is a 25 amp fuse used on the timer solenoid in addition to (Item 2) [A].

NOTE: Before replacing any fuse, find and fix the problem that caused the circuit overload. Make sure the key switch is in the OFF position before replacing the fuse.

Service The Electrical System (and Battery)

Remove the right side cover [C], using the start key to unlock the cover.



ELECTRICAL SYSTEM (Cont'd)

Service The Electrical System (and Battery) (Cont'd)

The battery cables must be clean and tight. Remove any acid or corrosion from the battery and cables using a sodium bicarbonate and water solution. Cover the battery terminals and cable ends with battery saver grease [A].

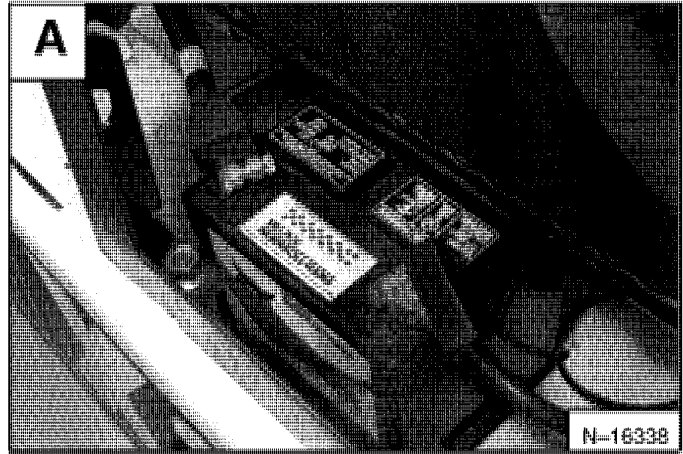
Check for broken or loose connections.

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

With factory equipped battery, no maintenance is needed as this is a maintenance free battery.

If the machine has a Bobcat parts replacement battery installed, check the electrolyte level in the battery.

If it is lower than 1/2 inch (13 mm) above the plates, add distilled water only.



WARNING

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-2065-1296

ELECTRICAL SYSTEM (Cont'd)

Using A Booster Battery (Jump Starting)

If it is necessary to use a booster battery to start the engine. **BE CAREFUL!**

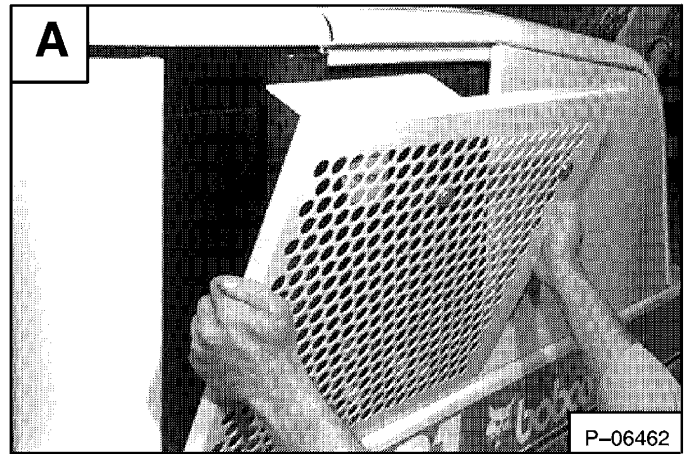
Make sure the swing lock is in the engaged position.

The key switch must be in the OFF position.

The booster battery must be 12 volt.

Using the start key, unlock the two side cover locks.

Tilt the top of the side cover out and lift up on the side cover to remove **[A]**.



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 that the second machine is NOT running while using the glow plugs. High voltage spikes from a running machine can burn out the glow plugs.

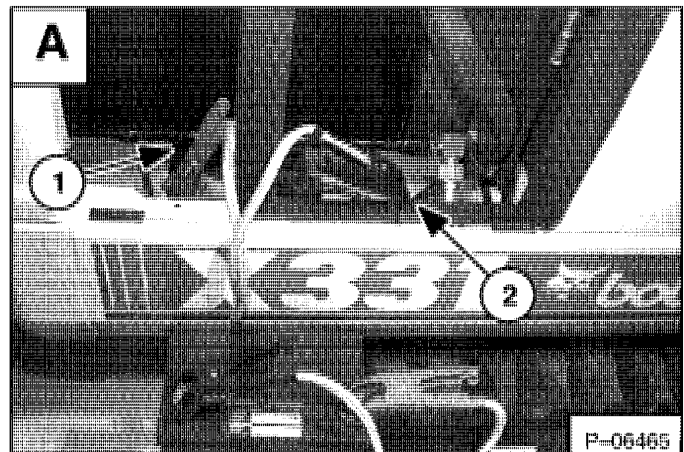
I-2060-0195

Connect the 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) **[B]** of the machine battery.

Connect the end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable to the frame (Item 2) **[B]**.

NOTE: See Cold Temperature Starting Procedure, Page 23.

Start the engine. After the engine is running, remove the cable (Item 2) **[B]** connected to the frame first. Disconnect the cable from the machine battery (Item 1) **[B]**.



! WARNING

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

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

Battery gas can explode and cause serious injury.

W-2066-1296

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 loader (Remove both cables from the battery).
- Extra battery cables (booster cables) are connected wrong.

I-2023-1285

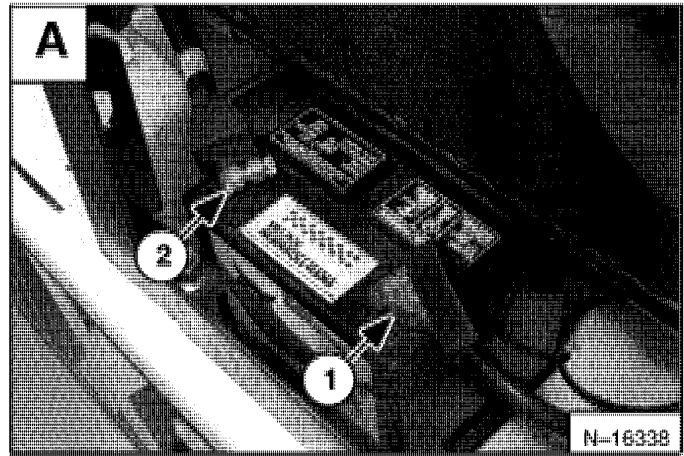
ELECTRICAL SYSTEM (Cont'd)

Removal And Installation Of The Battery

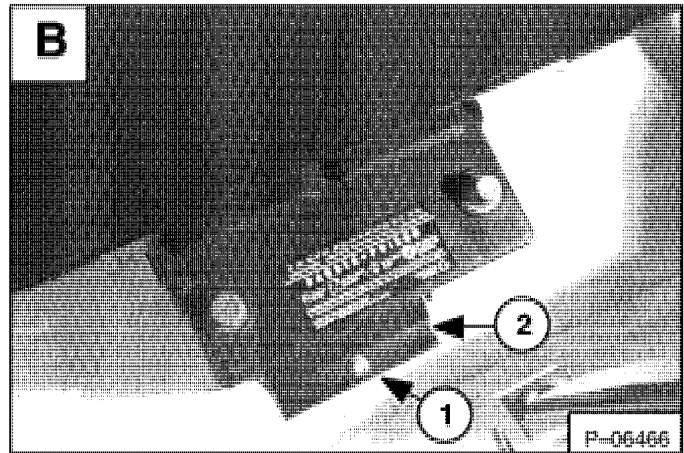
Remove the right side cover. (See Page 47.)

Disconnect the negative (–) cable (Item 1) [A] first.

Disconnect the positive (+) cable (Item 2) [A].



Remove the bolt (Item 1) [B] and remove the hold down clamp (Item 2) [B].



Remove the battery from the compartment [C].

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 bolt.

Connect the battery cables. Connect the negative (–) cable (Item 1) [A] last to prevent sparks at the terminal.



! WARNING

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

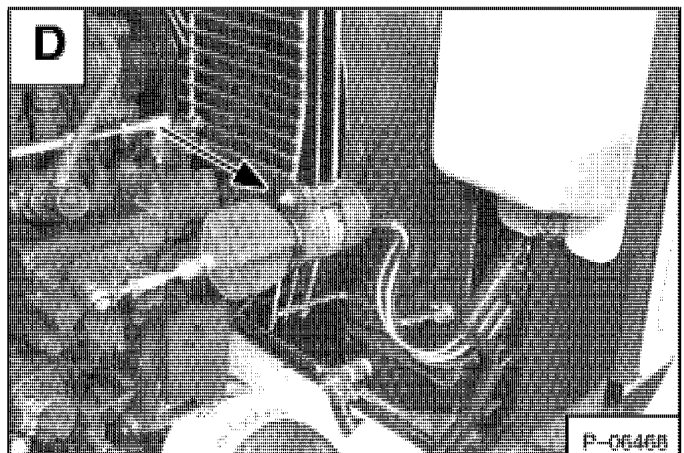
In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

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

W-2065-1296

Electric Solenoid (Engine Stop)

The electric solenoid (Item 1) [D] shuts off fuel supply and stops the engine when the key is turned to the OFF position.



HYDRAULIC SYSTEM

Checking And Adding Fluid

To check and add hydraulic fluid to the reservoir, use the following procedure:

1. Put the machine on a flat level surface.
2. Retract the arm and bucket cylinders, put the bucket on the ground and lower the blade. Stop the engine.
3. Check the hydraulic fluid level, it must be visible in the sight gauge (Item 1) [A] located on the side of the hydraulic reservoir.
4. If the fluid level is not correct, open the hydraulic tank access door.
5. Remove oil fill cap [B].
6. Check the condition of the fill strainer [C]. The screen must be installed in fill neck when adding oil.
7. Add the correct fluid to the reservoir until it is visible in the sight gauge. (See *FUEL, COOLANT AND LUBRICANTS Chart*, Page 92.)
8. Install the reservoir cap and close and lock the access door.

Diagnostic Couplers

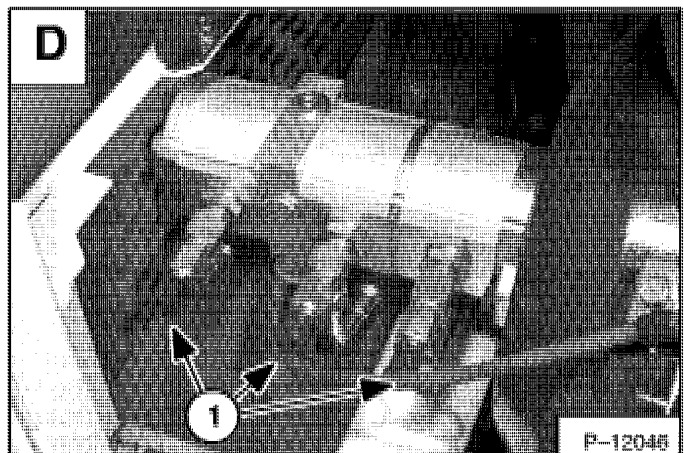
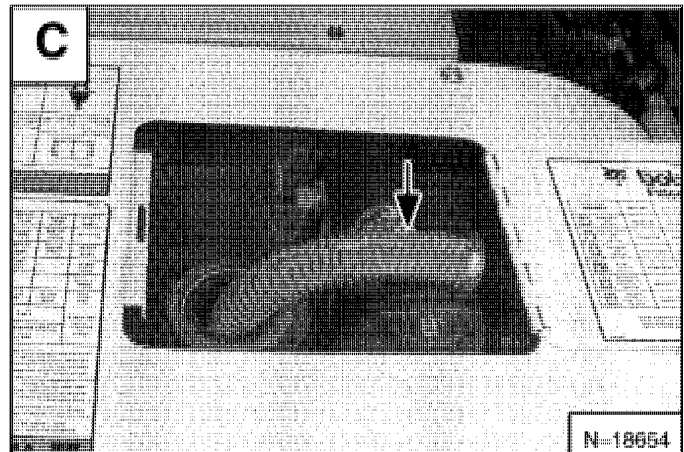
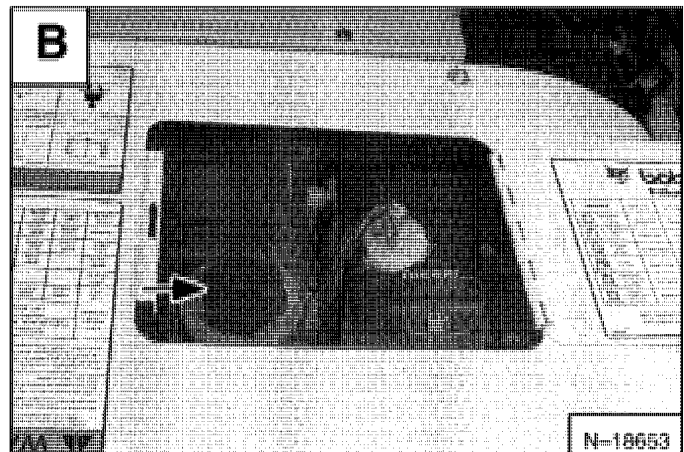
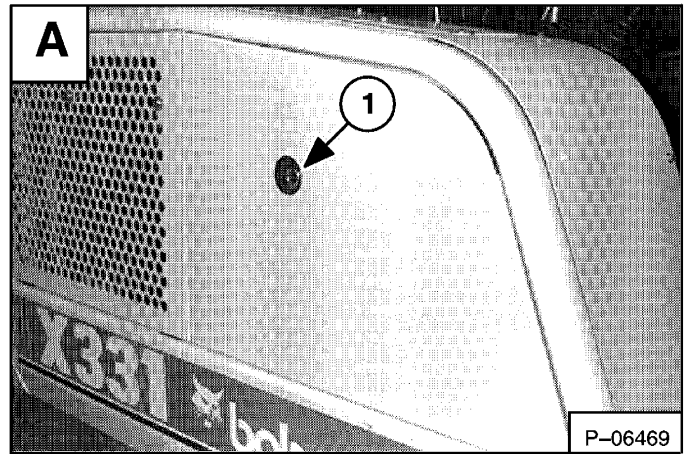
The diagnostic couplers are located on each hydraulic pump (Item 1) [D].

The couplers can be used to check circuit pressures. (Refer to the Service Manual.)

WARNING

Hydraulic fluid escaping under pressure can have sufficient force to enter a person's body by penetrating the skin. This can cause serious injury and possibly death if proper medical treatment by a physician familiar with this injury is not received immediately.

W-2145-0290

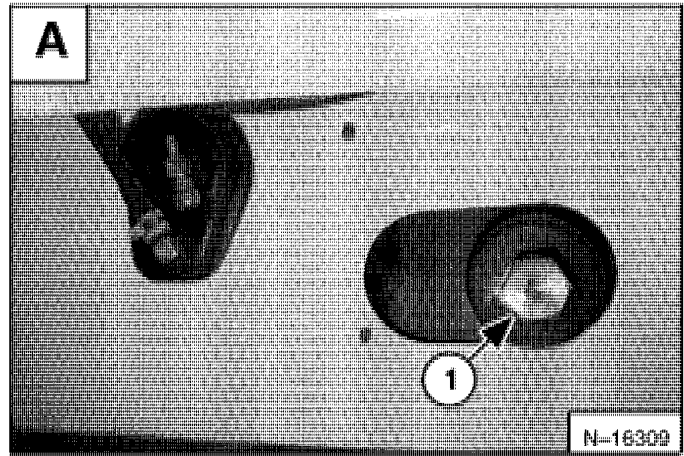


HYDRAULIC SYSTEM (Cont'd)

Replacing The Hydraulic Oil

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

1. Move the upperstructure so there is clearance for the reservoir drain between the tracks.
2. Retract the arm and bucket cylinders, lower the bucket to the ground. Stop the engine.
3. Remove and replace the hydraulic filter.
4. Remove the drain plug (Item 1) **[A]** from the bottom of the reservoir.
5. Drain the fluid into a container.
6. Install the drain plug.
7. Add approximately 10.5 gals. (40 L) of fluid to the reservoir. (See *FUEL, COOLANT AND LUBRICANTS Chart*, Page 92.)
8. Run the machine through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.



WARNING

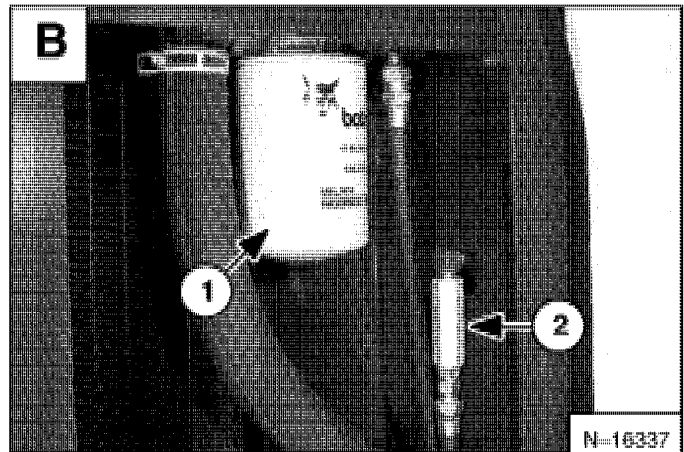
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285

Replacing The Hydraulic Filter

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

1. Open the right side cover. (See Page 47.)
2. Use a filter wrench and remove the filter element (Item 1) **[B]**.
3. Clean the housing where the filter gasket makes contact.
4. Put clean hydraulic fluid on the gasket. Install the new filter element and hand tighten only.
5. Start the engine. Run the machine through the hydraulic functions. Stop the engine. Check the fluid level at the reservoir and add as needed. Check around the filter for leaks.



Replacing The Drain Line Filter

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

1. Open the right side cover. (See Page 47.)
2. Remove the filter cartridge (Item 2) **[B]**.
3. Disassemble the cartridge and clean thoroughly.
4. Install the filter cartridge.

SPARK ARRESTOR MUFFLER

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

Do not operate the excavator with a defective exhaust system.

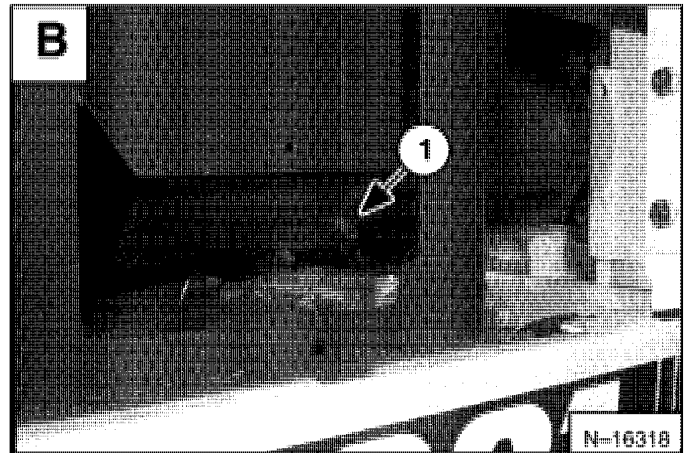
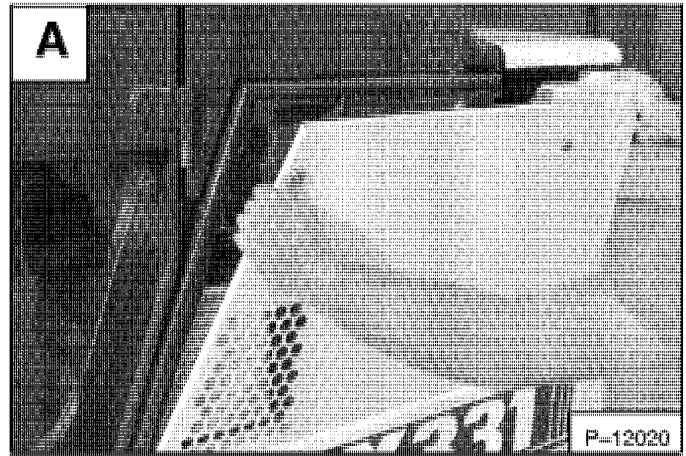
IMPORTANT

This excavator is factory equipped with a U.S.D.A. Forestry Service approved spark arrestor muffler. It is necessary to do maintenance on this spark arrestor muffler to keep it in working condition. The spark arrestor muffler must be serviced by dumping the spark chamber every 100 hours of operation.

If this machine is operated on flammable forest, brush or grass covered land, it must be equipped with a spark arrestor attached to the exhaust system and maintained in working order. Failure to do so will be in violation of California State Law, Section 4442 PRC.

Make reference to local laws and regulations for spark arrestor requirements.

I-2061-0195



Stop the engine. Open the engine cover.

Using the start key, unlock and remove the left side cover [A].

Remove the plug (Item 1) [B] from the bottom of the muffler.

! 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

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

Stop the engine. Install and tighten the plug.

Close the engine cover.

! WARNING

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-2050-1285

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

W-2011-1285

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

W-2068-1285

TRACK TENSION

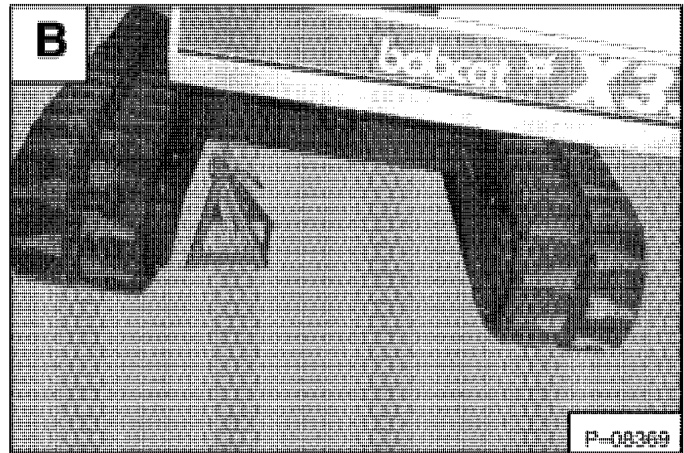
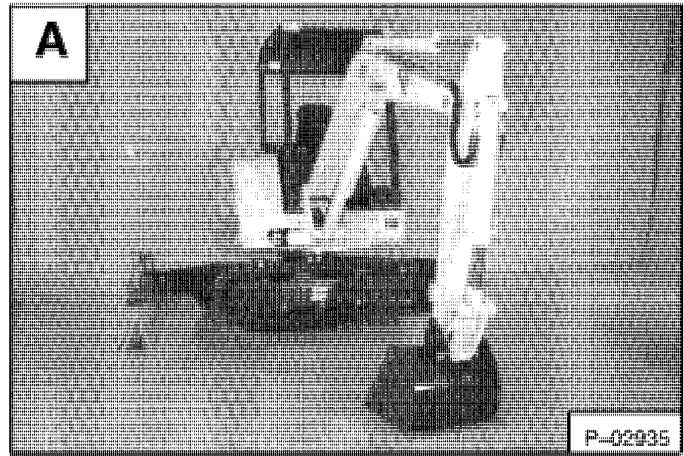
NOTE: The wear of the pins and bushings on the undercarriage vary with the working conditions and the different types of soil conditions. It is necessary to inspect track tension to maintain the correct tension, see **SERVICE SCHEDULE** Page 39 for the correct service interval.

Adjustment

Raise one side of the machine using the boom and arm [A] (Approximately 4 inches).

Raise the blade fully and install jackstands under the blade and track frame [A] & [B]. Lower the boom until all machine weight is on the jackstands.

Stop the engine.



! WARNING

AVOID INJURY

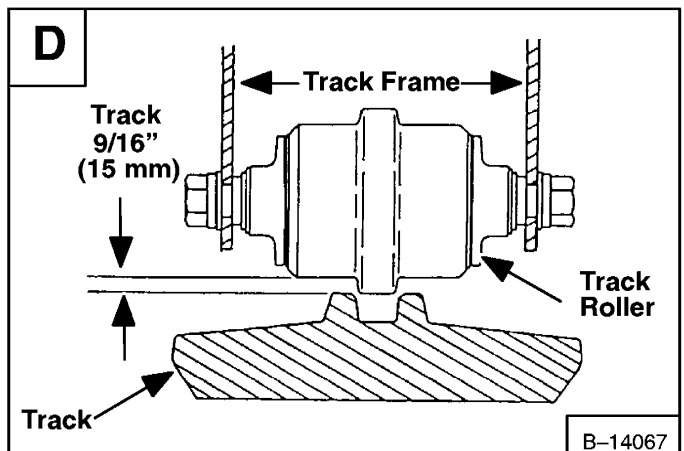
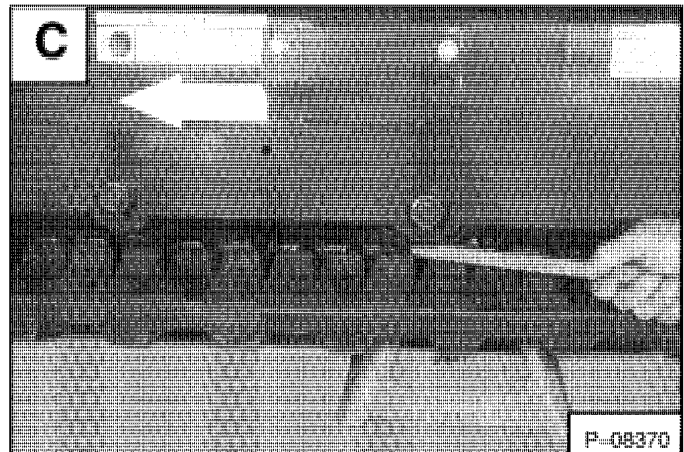
Keep fingers and hands out of pinch points when checking the track tension.

W-2142-0189

Rubber Tracks

Measure the rubber track sag at either middle track roller [C]. 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 lug [C] & [D].

Rubber Track Gap 9/16 inch (15 mm)

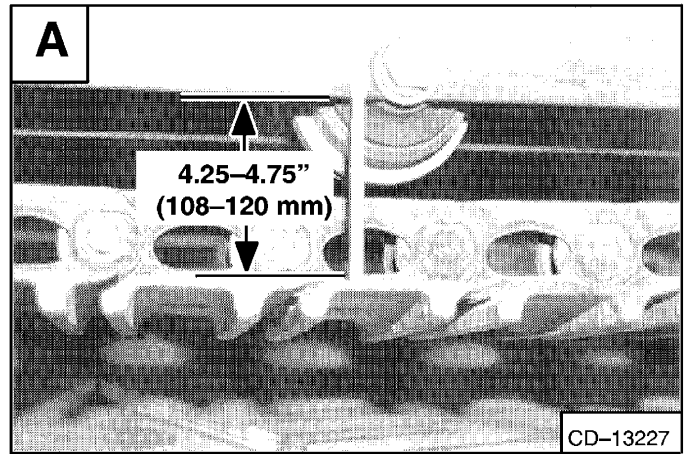


TRACK TENSION (Cont'd)

Steel Tracks

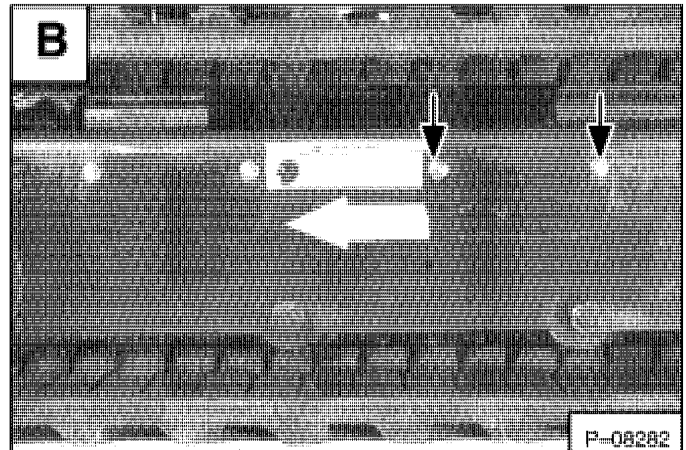
Measure the steel track sag at the center of the track, between the lower edge of the track frame and the top surface of the track [A].

Steel Track Sag 4.25–4.75 inches (108–120 mm)

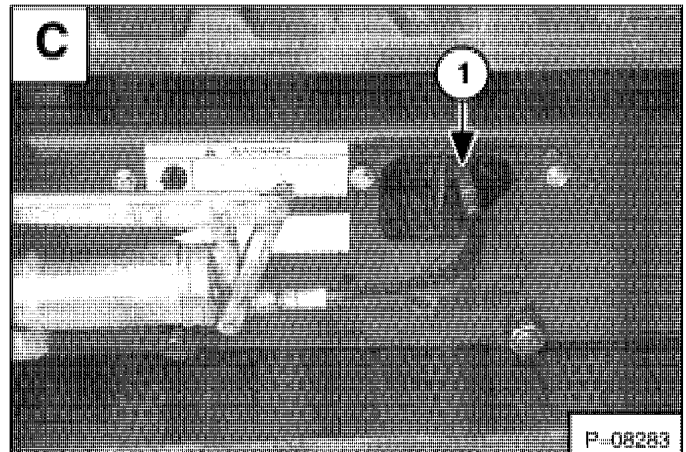


To adjust the track tension, do the following:

Loosen the two bolts from the cover [B]. Pivot the cover downwards.



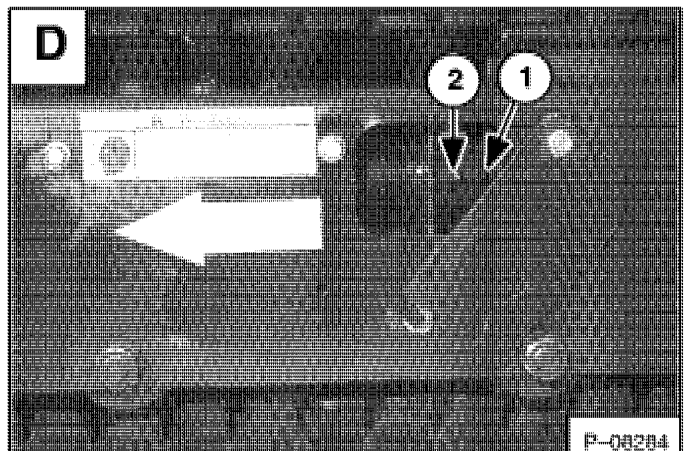
Add grease to the fitting (Item 1) [C] until the track tension is correct.



Loosen the bleed fitting (Item 1) [D] to release tension from the track.

NOTE: Do not loosen the grease fitting (Item 2) [D].

Repeat the procedure for the other side.



TRAVEL MOTOR

Checking Oil Level

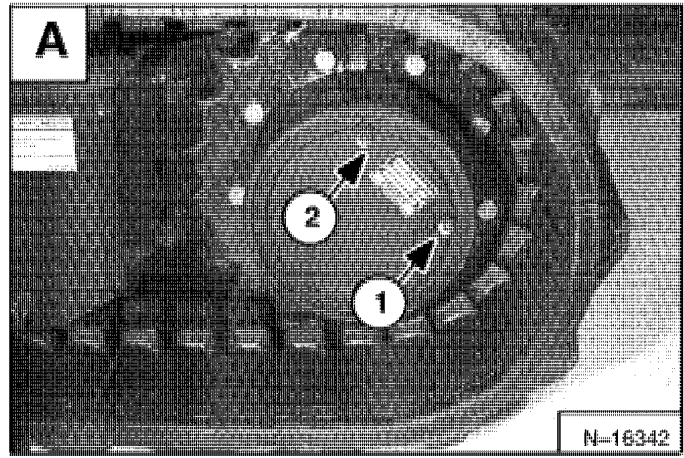
Put the machine on a level surface with the plugs positioned as shown in figure [A].

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

Add gear lube 90W through the hole (Item 2) [A] if the oil level is below the hole. (See *FUEL, COOLANT AND LUBRICANTS Chart*, Page 92.)

Install and tighten both plugs.

Repeat the procedure for the other side.



Draining And Refilling

See the SERVICE SCHEDULE Page 39 for the correct service interval.

Put the machine on a level surface with the plugs positioned as shown in figure [B].

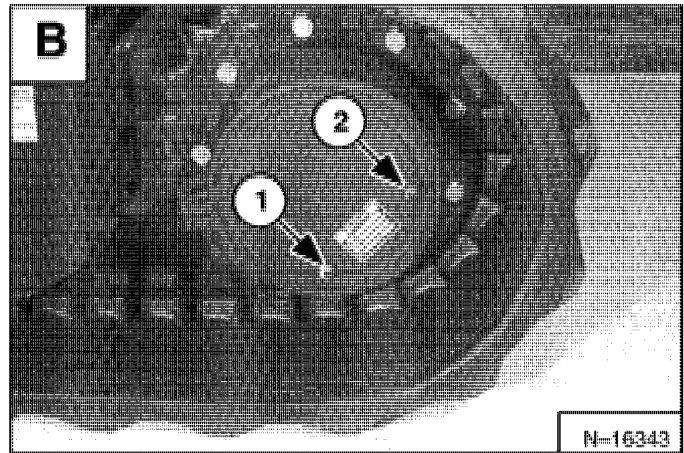
Remove the bottom plug (Item 1) [B] and top plug (Item 2) [B].

After all the gear lube is removed, rotate the drive motor as shown in figure [A].

Add 1.06 quarts (1,0 L) of gear lube 90W to the top plug hole (Item 2) [A] (or until the gear lube level is at the bottom edge of the plug hole (Item 1) [A].)

Install and tighten the plugs.

Repeat the procedure for the other side.

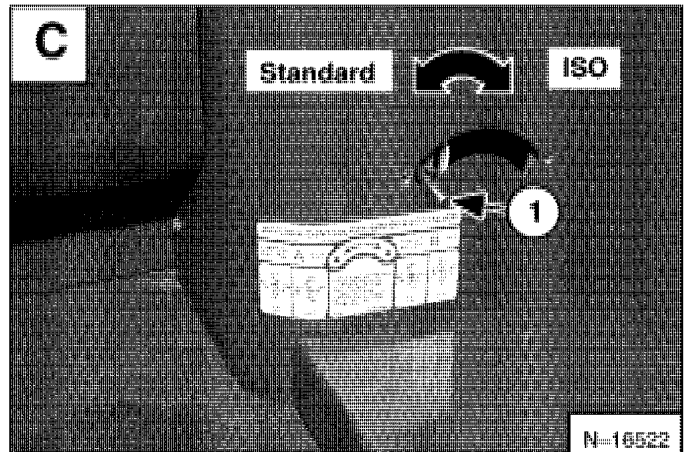


JOYSTICK CONTROL CHANGE

The information below applies to all excavators except those sold in Europe. Excavators sold in Europe do not have this valve.

For 331 S/N 512918584 and Above, 331E S/N 517711120 & Above and 334 S/N 516711823 & Above.

The above listed models have a control valve (Item 1) [C] factory installed that allow for convenient changing of the joystick control pattern. The valve is located in the right hand console, below the seat.



ISO to STANDARD Control Pattern

Move the control valve lever (Item 1) [C] counterclockwise for standard control pattern.

STANDARD to ISO Control Pattern

Move the control valve lever (Item 1) [C] clockwise for ISO control pattern.

JOYSTICK CONTROL CHANGE (Cont'd)

For 331 S/N 512915200–512918583, 331E S/N 517711001–517711119 and 334 S/N 516711001–516711822.

Rotate the upperstructure so that it is 90° to the excavator tracks.

Remove the center floor panel. (See Service Manual.)

NOTE: Remove the center floor panel to access the front of the control valve (hoses 1 and 2).

NOTE: Access the rear of the control valve from under the left side of the upperstructure (hoses 3 and 4).

ISO to STANDARD Control Pattern

Mark the hoses as shown [A].

Remove hoses (Items 1 & 2) [A] from the end of the control valve and change their position on the control valves as shown in [B].

Remove hoses (Items 3 & 4) [A] from the end of the control valve and change their position on the control valves as shown in [B].

The Right Hand Joystick will now control the arm (arm out and arm in) and the bucket curl.

The Left Hand Joystick will not control the boom (boom up and boom down) and the upperstructure swing.

DO NOT change any of the hoses on the top of the control valve to the work cylinders. Change only the hoses that connect the joysticks to the control valve spools.

STANDARD To ISO Control Pattern

Mark the hoses as shown [B].

Remove hoses (Items 1 & 2) [B] from the end of the control valve and change their position on the control valves as shown in [A].

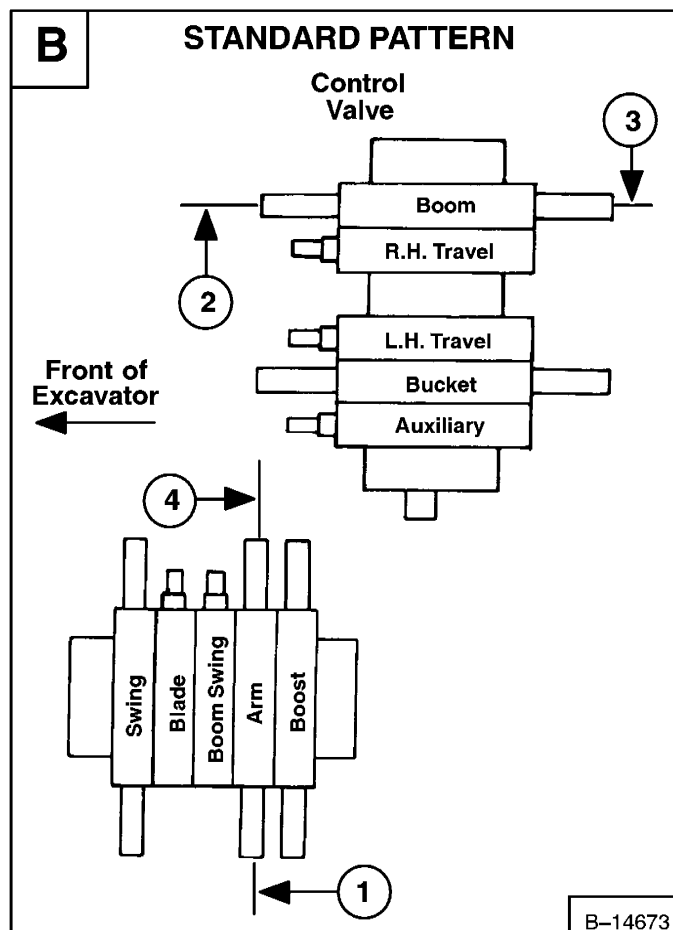
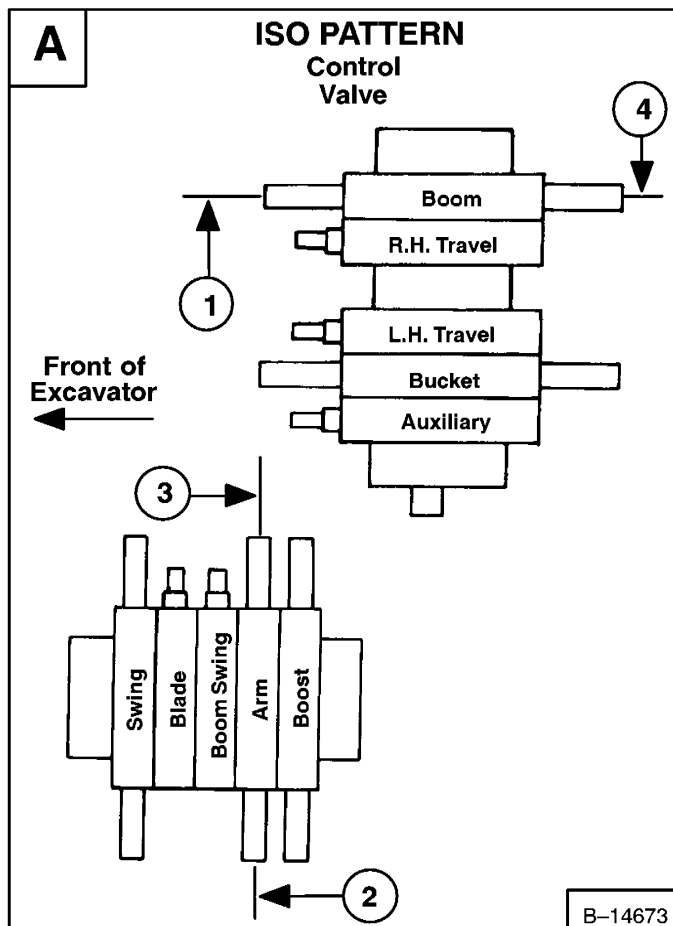
Remove hoses (Items 3 & 4) [B] from the end of the control valve and change their position on the control valves as shown in [A].

The Right Hand Joystick will now control the boom (boom up and boom down) and the bucket curl.

The Left Hand Joystick will now control the arm (arm out and arm in) and the upperstructure swing.

DO NOT change any of the hoses on the top of the control valve to the work cylinders. Change only the hoses that connect the joysticks to the control valve spools.

Kits are available to install the control valve (shown on Page 56 [C]) for the above listed models. See you Bobcat Excavator dealer for information.



LUBRICATION OF THE HYDRAULIC EXCAVATOR

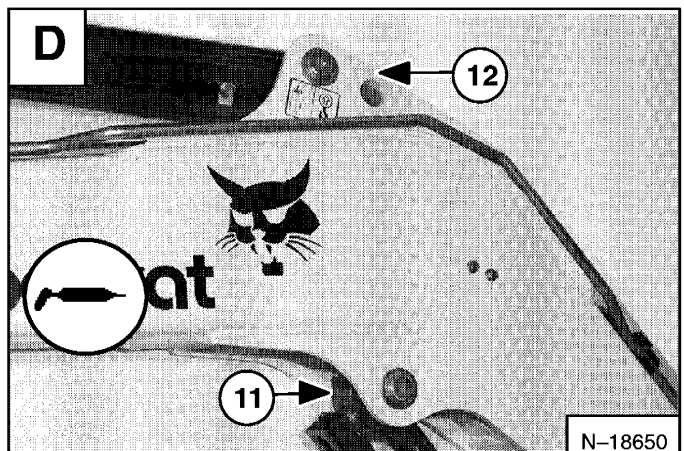
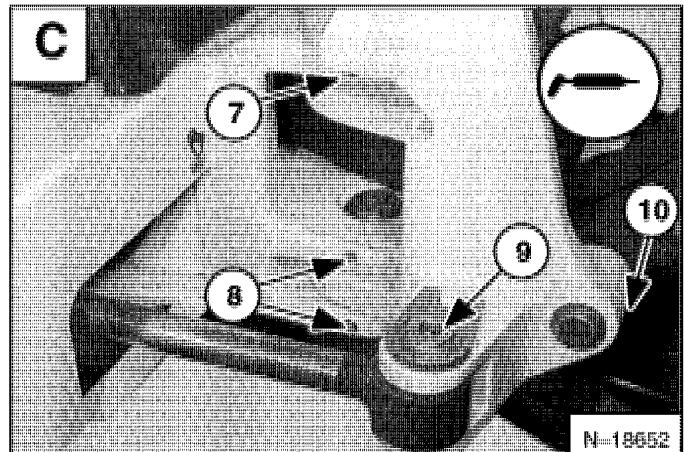
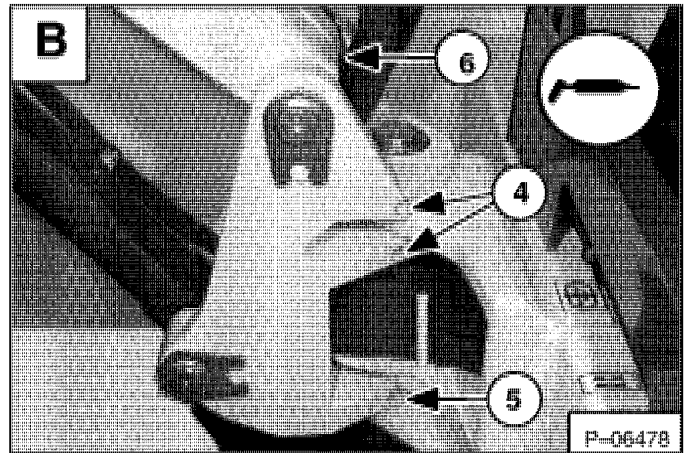
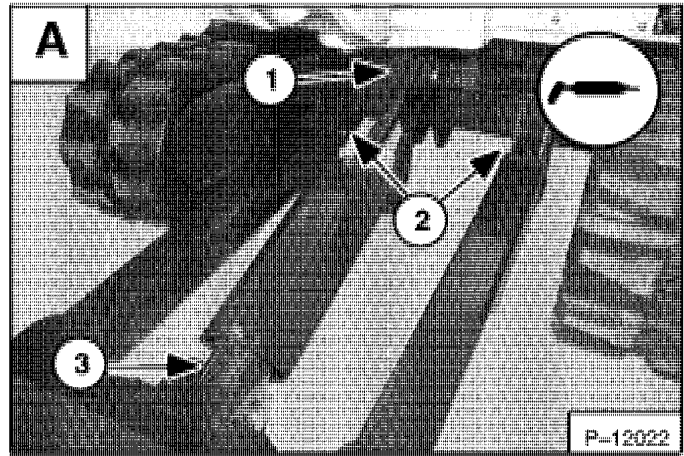
Lubricate the Hydraulic Excavator as specified in the *SERVICE SCHEDULE* Page 39 for the best performance of the machine.

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 Hydraulic Excavator **EVERY 8–10 HOURS**: 

Ref.	Description (# of Fittings)
------	-----------------------------

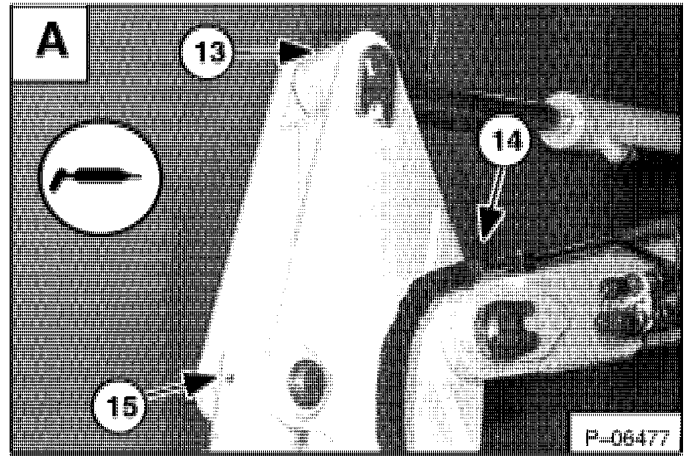
- | | |
|-----|---------------------------------------|
| 1. | Blade Cylinder Rod End (1) [A]. |
| 2. | Blade Pivots (2) [A]. |
| 3. | Blade Cylinder Base End (1) [A]. |
| 4. | Boom Swing Bracket Pivot (2) [B]. |
| 5. | Boom Swing Bracket (1) [B]. |
| 6. | Boom Base Pivot (1) [B]. |
| 7. | Boom Swing Bracket Top Pivot (1) [C]. |
| 8. | Boom Swing Bracket Pivot (2) [C]. |
| 9. | Boom Swing Cylinder Rod End (1) [C]. |
| 10. | Boom Cylinder Base End (1) [C]. |
| 11. | Boom Cylinder Rod End (1) [D]. |
| 12. | Arm Cylinder Base End (1) [D]. |



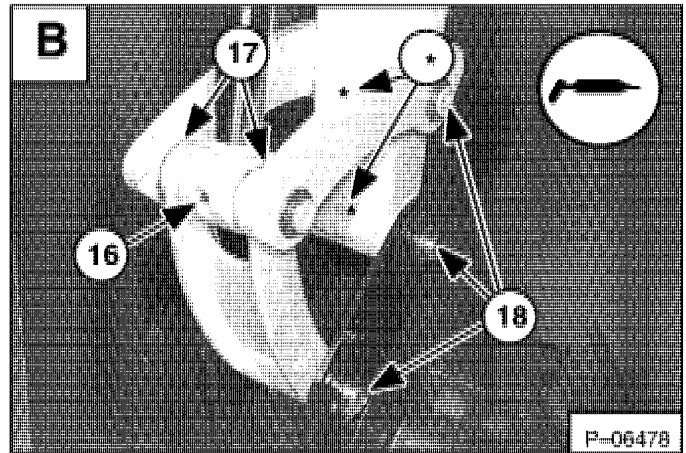
LUBRICATION OF THE HYDRAULIC EXCAVATOR (Cont'd)

Ref.	Description	(# of Fittings)
------	-------------	-----------------

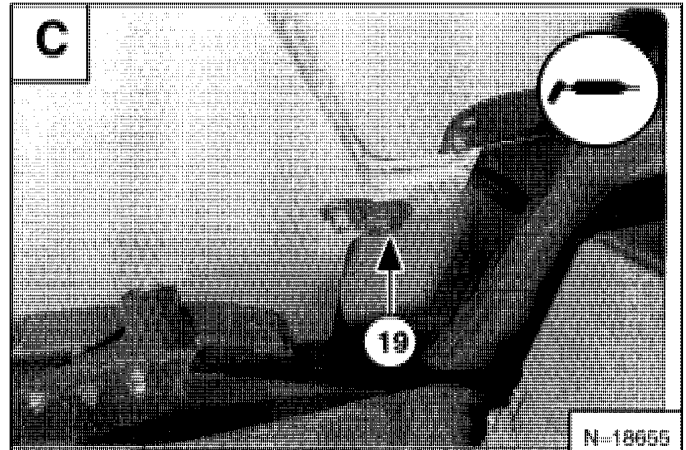
- | | | |
|-----|-----------------------------------|--|
| 13. | Arm Cylinder Rod End (1) [A]. | |
| 14. | Arm Base Pivot (1) [A]. | |
| 15. | Bucket Cylinder Base End (1) [A]. | |



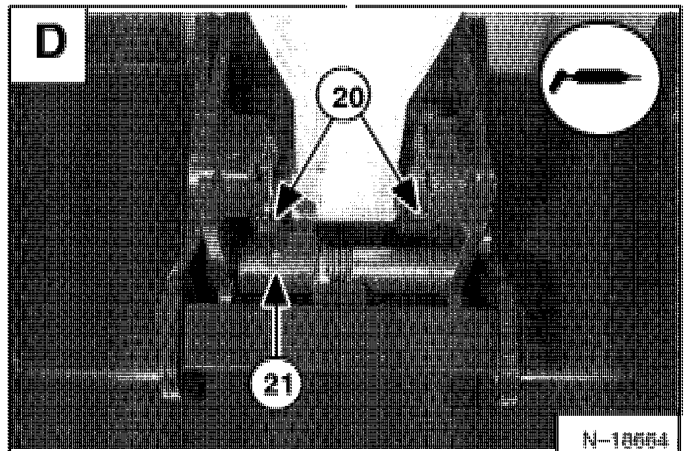
- | | | |
|-----|----------------------------------|--|
| 16. | Bucket Cylinder Rod End (1) [B]. | |
| 17. | Bucket Link Pivots (2) [B]. | |
| 18. | Bucket Pivots (3) [B]. | |
- (For later models, the two arm pin grease fittings are now located on the lower end of the arm as marked with * asterisk.)



- | | | |
|-----|---------------------------------------|--|
| 19. | Boom Swing Cylinder Base End (1) [C]. | |
|-----|---------------------------------------|--|

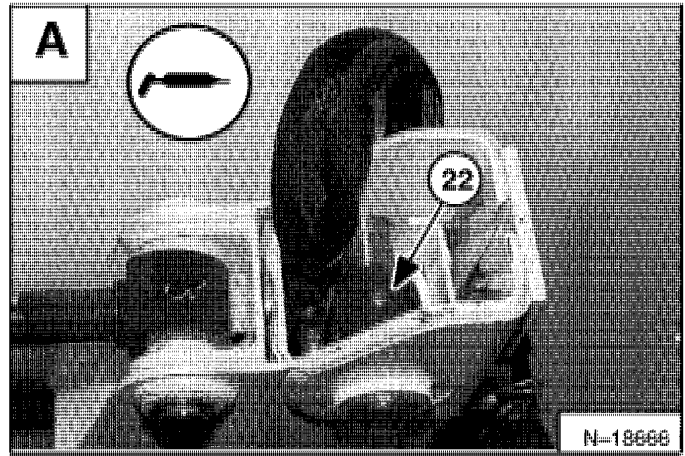


- | | | |
|-----|---------------------------------|--|
| 20. | X-Change™ latch pivots (2) [D]. | |
| 21. | X-Change™ locking pawl (1) [D]. | |



LUBRICATION OF THE HYDRAULIC EXCAVATOR (Cont'd)

22. Extendable arm cylinder base end (1) [A].

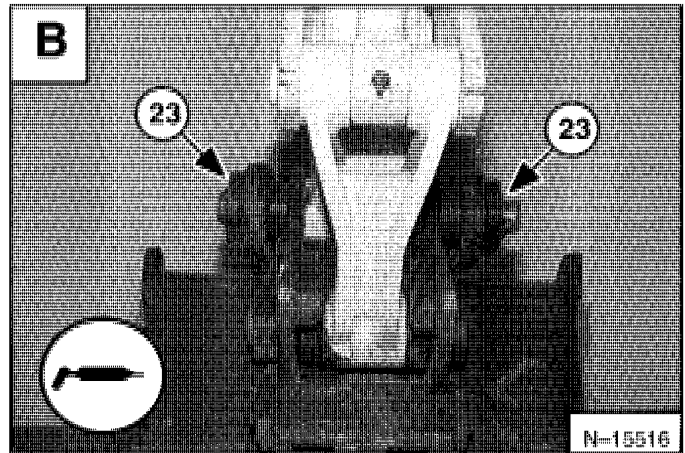


If the excavator is equipped with the optional lifting clamp, lubricate the following locations on the hydraulic excavator **EVERY 8-10 HOURS**:

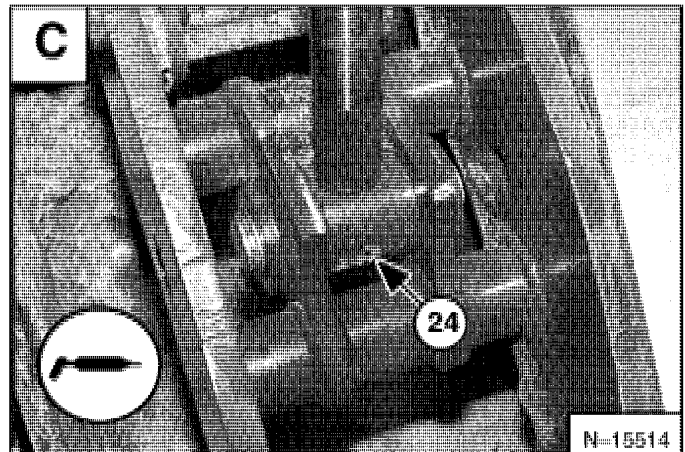


Ref. Description (# of Fittings)

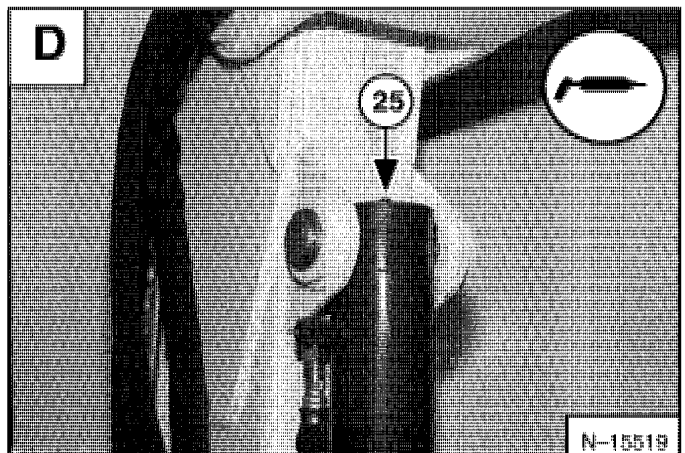
23. Clamp Pivot Pin (2) [B].



24. Cylinder Rod End (1) [C].



25. Cylinder Base End (1) [D].



LUBRICATION OF THE HYDRAULIC EXCAVATOR (Cont'd)

Lubricate the following locations on the Hydraulic Excavator **EVERY 50 HOURS:** 

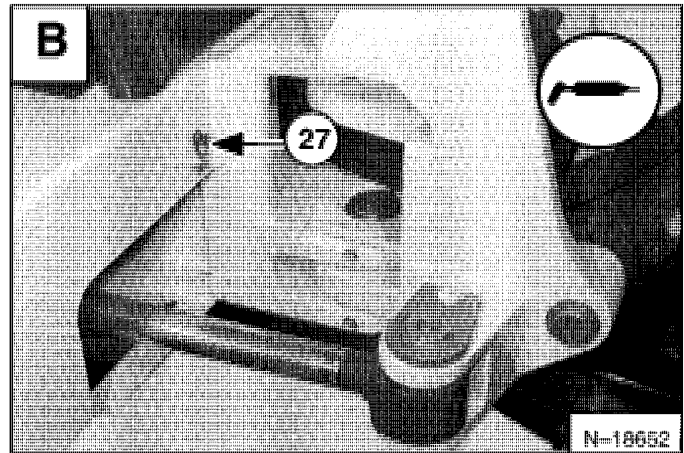
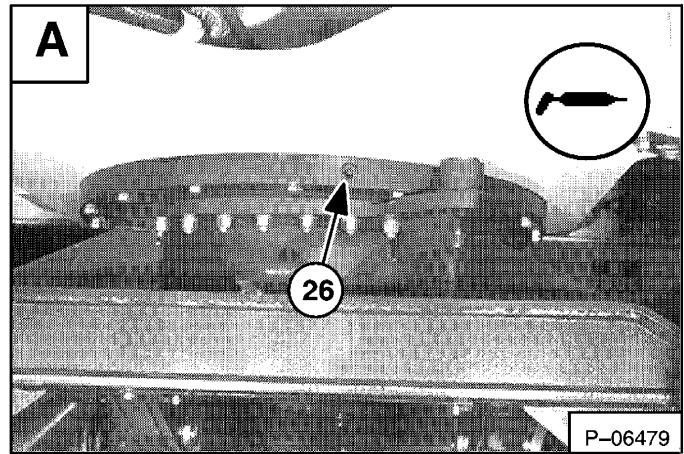
Ref.	Description (# of fittings)
------	-----------------------------

26.	Swing Circle Ball Bearings (2) [A].
-----	-------------------------------------

NOTE: Do not over grease the swing circle or damage to the seals could result. Install four to five pumps of grease from a grease gun into each of the two grease fittings. Rotate the upperstructure 90° and install four to five pumps of grease into each of the two grease fittings.

27.	Swing Circle Pinion (1) [B].
-----	------------------------------

NOTE: Install four pumps of grease from a grease gun into the grease fitting. Rotate the upperstructure 180° and install four more pumps of grease into the grease fitting.



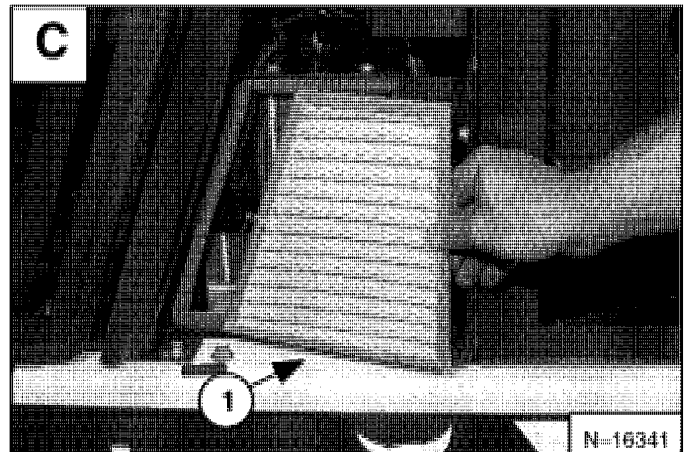
HEATER AIR FILTER (With Cab Option Only)

See the *SERVICE SCHEDULE* Page 39 for the correct service interval.

Using the start key, unlock and remove the left side panel.

Remove the air filter (Item 1) [C].

Clean the filter with compressed air only.





Bobcat®

MACHINE SIGN TRANSLATIONS

WARNING (6804231)	65
LIFT CAPACITY CHART (6806615) 331 w/o counterweights	66
LIFT CAPACITY CHART (6805625) 331 w/counterweights	68
LIFT CAPACITY CHART (6804687) 331E (or 331/334 if equipped with extendable arm)	70
LIFT CAPACITY CHART (6806616) 334 w/o counterweights or 331 equipped w/long arm w/o counterweights	72
LIFT CAPACITY CHART (6805626) 334 w/counterweights or 331 equipped w/long arm and w/counterweights	74
SERVICE SCHEDULE (6804326)	76
WARNING (6804230)	78
WARNING (6577754, 6804114, 6804232 & 6804233)	79

**MACHINE SIGN
TRANSLATIONS**



Bobcat®

ADVERTENCIA (SPANISH)

Los procedimientos de carga, transporte e izado inadecuados pueden provocar lesiones graves o la muerte.

TRANSPORTE DE LA UNIDAD

- Use rampas metálicas de carga con entablado y superficies antideslizantes.
- Fije las rampas a la plataforma de apoyo del camión.
- Aplique el freno de estacionamiento del camión y bloquee los neumáticos del camión.
- El ángulo de la rampa no debe exceder los 15°.
- El tope de la rampa debe estar a nivel con la cama del camión.
- Empalme el bloqueo del giro.
- Amarre la unidad con cadenas de sujeción y bloquee las orugas.

PARA IZAR LA UNIDAD

- El dispositivo de izado debe tener capacidad adecuada para el peso de la unidad.
- Mantenga el centro de gravedad y el equilibrio al izar.
- No haga girar el pescante o el armazón superior. Aplique el bloqueo del giro.
- Nunca ize cuando el operador está en la unidad.

AVERTISSEMENT (FRENCH)

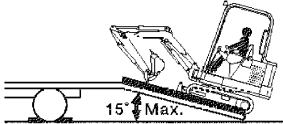
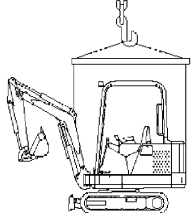
Des procédures de chargement, transport et levage incorrectes risquent de provoquer des blessures graves ou la mort.

TRANSPORT DE LA MACHINE

- Utilisez une rampe de chargement métallique à surface antidérapante, munie de bordures latérales.
- Fixez la rampe à la plate-forme du camion.
- Serrez le frein de stationnement du camion et calez ses roues.
- L'angle de la rampe ne doit pas dépasser 15°.
- Le haut de la rampe doit être au niveau de la plate-forme du camion.
- Engagez le verrou de pivotement.
- Arrimez la machine avec des chaînes et calez les chenilles.

LEVAGE DE LA MACHINE

- Le dispositif de levage doit avoir la capacité suffisante pour le poids de la machine.
- Veillez à conserver le centre de gravité et l'équilibre lors du levage.
- Ne faites pas pivoter la flèche ni le châssis supérieur. Engagez le verrou de pivotement.
- Ne levez jamais la machine lorsque l'opérateur s'y trouve.

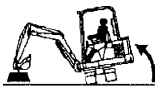
 WARNING	
Improper loading, transporting and lifting procedures can cause serious injury or death.	
TRANSPORTING MACHINE • Use metal loading ramps with boarders and slip resistant surfaces. • Secure ramps to truck bed.  • Engage truck parking brake and block truck tires. • Ramp angle must not exceed 15°. • Top of ramp must be level with truck bed. • Engage swing lock. • Secure machine with hold down chains and block tracks. 39894	LIFTING MACHINE • Lifting device must have adequate capability for weight of machine. • Maintain center of gravity and balance when lifting. • Do not swing boom or upper frame. Engage the swing lock. • Never lift with operator on machine.  SW 98 6804231



WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

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

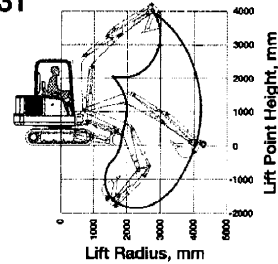


Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331

BOOM LENGTH 2400 mm (94.5 in.)
ARM LENGTH 1200 mm (47.2 in.)
COUNTERWEIGHT 208.5 kg (459 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
STANDARD BUCKET 609 mm (24.0 in.)
97.5 kg (215 lbs.)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)		515* (1136)		444* (980)		515* (1136)		397* (875)		535* (1180)		405* (893)
2000 (78.7)		484* (1067)	448* (988)	480* (1014)		464* (1023)	428* (945)	346 (762)		472* (1041)	349 (770)	312 (687)
1000 (39.4)		724* (1597)	535* (1180)	523* (1154)		685* (1510)	363 (800)	325 (717)		509 (1122)	312 (687)	278 (612)
Ground		914* (2015)	622* (1371)	598* (1319)		677 (1493)	359 (792)	339 (747)		559 (1232)	301 (665)	281 (620)
-1000 (-39.4)	1746* (3851)	961* (2119)		705* (1554)	1214 (2676)	681 (1502)		424 (935)	1080 (2380)	559 (1232)		359 (792)

* Rated Hydraulic Lift Capacity

40421

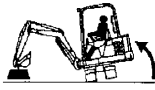
SW 99 6806615



ADVERTENCIA

LA SOBRECARGA PUEDE LADEAR LA EXCAVADORA Y CAUSAR LESIÓN O MUERTE

- No levantar o sostener ninguna carga que exceda estos valores nominales de carga y altura específica.
- La carga nominal total es mostrada. El peso de todos los mecanismos de levante deberá ser deducido para determinar la carga neta que puede ser levantada.

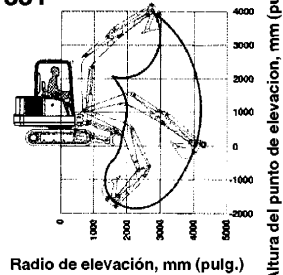


Donde se aplica, las especificaciones se ajustan a las normas ISO. Las especificaciones se hallan sujetas a modificaciones sin previo aviso. El punto de elevación es el punto de articulación del cucharón con el cucharón estándar puesto y el cilindro del cucharón totalmente extendido.

EXCAVADORA MODELO 331

LARGO DE PESCANTE 2400mm (94.5 plg)
LARGO DEL BRAZO 1200 mm (47.2 plg)
CONTRAPEÑO 208.5 kg (459 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
CUCHARÓN ESTÁNDAR 609 mm (24.0 plg)
97.5 kg (215 lbs.)

PRESIÓN DEL CIRCUITO
TRABAJANDO - 172 bar (2500 psi)
DETENIDA - 203 bar (2950 psi)



ALTURA DE PUNTO DE LEVANTE	CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA HOJA, HOJA BAJA-kg (lb)				CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA HOJA, HOJA ARRIBA-kg (lb)				CAPACIDAD NOMINAL DE ELEVACIÓN LATERAL, HOJA ARRIBA-kg (lb)			
	RADIO DE LEVANTE				RADIO DE LEVANTE				RADIO DE LEVANTE			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)		515* (1136)		444* (980)		515* (1136)		397* (875)		535* (1180)		405* (893)
2000 (78.7)		484* (1067)	448* (988)	480* (1014)		464* (1023)	428* (945)	346 (762)		472* (1041)	349 (770)	312 (687)
1000 (39.4)		724* (1597)	535* (1180)	523* (1154)		685* (1510)	363 (800)	325 (717)		509 (1122)	312 (687)	278 (612)
SUELO		914* (2015)	622* (1371)	598* (1319)		677 (1493)	359 (792)	339 (747)		559 (1232)	301 (665)	281 (620)
-1000 (-39.4)	1746* (3851)	961* (2119)		705* (1554)	1214 (2676)	681 (1502)		424 (935)	1080 (2380)	559 (1232)		359 (792)

*Capacidad nominal de elevación hidráulica

40421

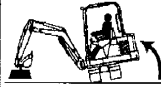
SW 99 6806615



WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

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

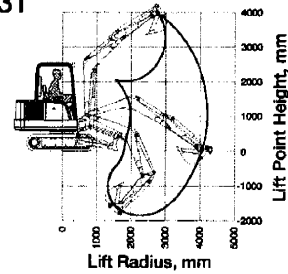


Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331

BOOM LENGTH 2400 mm (94.5 in.)
ARM LENGTH 1200 mm (47.2 in.)
COUNTERWEIGHT 367.0 kg (810 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
STANDARD BUCKET 609 mm (24.0 in.)
97.5 kg (215 lbs.)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				416* (918)				401* (885)				415* (916)
2000 (78.7)			471* (1038)	471* (1038)		505* (1114)	447* (985)	449* (990)		518* (1143)	459* (1011)	353 (778)
1000 (39.4)		802* (1768)	577* (1273)	532* (1173)		761* (1678)	431 (950)	364 (804)		604 (1332)	373 (824)	324 (714)
Ground	1666* (3673)	989* (2180)	670* (1477)	611* (1348)	1159 (2556)	664 (1464)	426 (939)	383 (844)	1001 (2208)	574 (1266)	365 (805)	339 (749)
-1000 (-39.4)	1937* (4270)	1043* (2300)		723* (1593)	1315 (2899)	626 (1381)		473 (1043)	1021 (2252)	564 (1245)		425 (937)

* Rated Hydraulic Lift Capacity

40421

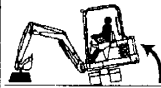
SW 99 6805825



ADVERTENCIA

LAS SOBRECARGAS PUEDEN VOLCAR LA EXCAVADORA Y CAUSAR LESIONES O LA MUERTE

- No levante ni soporte cargas que superen estas capacidades nominales a los radios y alturas de carga especificados.
- La cifra indicada corresponde a la capacidad nominal total. Es necesario restar el peso de todos los dispositivos de elevación para determinar la carga neta que se ha de levantar.

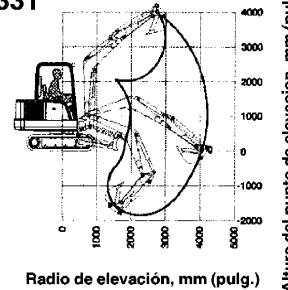


Donde corresponde, las especificaciones se ajustan a las normas ISO. Las especificaciones están sujetas a cambios sin previo aviso. El punto de elevación es el punto de articulación del cucharón con un cucharón estándar instalado y el cilindro del cucharón totalmente extendido.

EXCAVADORA MODELO 331

LARGO DEL PESCANTE 2400 mm (94.5 pulg.)
LARGO DEL BRAZO 1200 mm (47.2 pulg.)
CONTRAPESO 367.0 kg (810 lbs.)
X-CHANGE 24.9 kg (55 pulg.)
CUCHARÓN ESTÁNDAR 609 mm (24.0 pulg.)
97.5 kg (215 lbs.)

PRESIONES DEL CIRCUITO
DE TRABAJO 172 bar (2500 psi)
DE SOPORTE 203 bar (2950 psi)



Altura del punto de elevación, mm (pulg.)	CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE CUCHILLA, CUCHILLA BAJA - kg (lbs.)				CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA CUCHILLA, CUCHILLA ARRIBA - kg (lbs.)				CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LADO, CUCHILLA ARRIBA - kg (lbs.)			
	Radio de elevación, mm (pulg.)				Radio de elevación, mm (pulg.)				Radio de elevación, mm (pulg.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				416* (918)				401* (885)				415* (916)
2000 (78.7)			471* (1038)	471* (1038)		505* (1114)	447* (985)	449* (990)		518* (1143)	459* (1011)	353 (778)
1000 (39.4)		802* (1768)	577* (1273)	532* (1173)		761* (1678)	431 (950)	364 (804)		604 (1332)	373 (824)	324 (714)
SUELO	1666* (3673)	989* (2180)	670* (1477)	611* (1348)	1159 (2556)	664 (1464)	426 (939)	383 (844)	1001 (2208)	574 (1266)	365 (805)	339 (749)
-1000 (-39.4)	1937* (4270)	1043* (2300)		723* (1593)	1315 (2899)	626 (1381)		473 (1043)	1021 (2252)	564 (1245)		425 (937)

*Capacidad nominal de elevación hidráulica

40421

SW 99 6805825

AVERTISSEMENT

TOUTE SURCHARGE RISQUE DE FAIRE BASCULER L'EXCAVATRICE, PROVOQUANT DES BLESSURES GRAVES OU MORTELLES.

- Ne tentez pas de lever ni de maintenir des charges dont le poids dépasse ces valeurs nominales au-delà de la portée et de la hauteur spécifiées.
- La charge nominale totale est indiquée. Pour déterminer la charge nette pouvant être levée, déduisez le poids de tous les dispositifs de levage.

EXCAVATRICE MODÈLE 331

LONGUEUR DE LA FLÈCHE 2400 mm

(109,3 po)

LONGUEUR DU BRAS 1200 mm

(47,2 po)

CONTREPOIDS 367,0 kg (810 lb)

X-CHANGE 24,9 kg (55 pulg.)

GODET STANDARD 609 mm (24,0 po)

80,0 kg (176 lb)

Portée de levage mm (po)

Donde corresponde, las especificaciones se ajustan a las normas ISO. Las especificaciones están sujetas a cambios sin previo aviso.

El punto de elevación es el punto de articulación del cucharón con un cucharón estándar instalado y el cilindro del cucharón totalmente extendido.

PRESSIONS DE CIRCUIT

FONCTIONNEMENT 172 bar (2500 psi)

ATTENTE 203 bar (2950 psi)

Hauteur du point de levage mm (po.)	CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME ABAISSÉE - kg (lb.)				CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME LEVÉE - kg (lb.)				CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DU CÔTÉ, LAME LEVÉE - kg (lb.)			
	Portée de levage mm (po)				Portée de levage mm (po)				Portée de levage mm (po)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				416* (918)				401* (885)				415* (916)
2000 (78.7)			471* (1038)	471* (1038)		505* (1114)	447* (985)	449* (990)		518* (1143)	459* (1011)	353 (778)
1000 (39.4)		802* (1768)	577* (1273)	532* (1173)		761* (1678)	431 (950)	364 (804)		604 (1332)	373 (824)	324 (714)
AU SOL	1666* (3673)	989* (2180)	670* (1477)	611* (1348)	1159 (2556)	664 (1464)	426 (939)	383 (844)	1001 (2208)	574 (1266)	365 (805)	339 (749)
-1000 (-39.4)	1937* (4270)	1043* (2300)		723* (1593)	1315 (2899)	626 (1381)		473 (1043)	1021 (2252)	564 (1245)		425 (937)

*Capacité de levage hydraulique nominale

40421

SW 99 6805825



WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

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

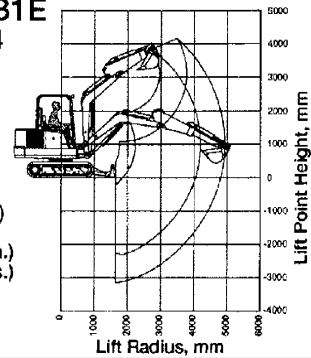


Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 331E (AND MODELS 331 OR 334 EQUIPPED WITH EXTENDIBLE ARM)

BOOM LENGTH 2400 mm (94.5 in.)
ARM LENGTH:
RETRACTED 1196 mm (47.1 in.)
EXTENDED 2019 mm (79.5 in.)
COUNTERWEIGHT 367.0 kg (809 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
STANDARD BUCKET 609 mm (24.0 in.)
97.5 kg (215 lbs.)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)					RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)					RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)				
	LIFT RADIUS - mm(in.)					LIFT RADIUS - mm(in.)					LIFT RADIUS - mm(in.)				
	ARM RETRACTED				ARM EXTENDED MAX.	ARM RETRACTED				ARM EXTENDED MAX.	ARM RETRACTED				ARM EXTENDED MAX.
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.		2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.		2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	
mm (in.)															
3000 (118.1)				317* (699)	185* (408)				308* (680)	184* (405)				313* (690)	192* (423)
2000 (78.7)		361* (795)	357* (787)	367* (809)	228* (502)		352* (776)	344* (758)	355* (782)	224* (494)		368* (811)	344* (759)	343* (756)	233* (513)
1000 (39.4)		568* (1252)	429* (946)	419* (924)	272* (599)		549* (1210)	410* (904)	319 (704)	266* (587)		564* (1244)	295 (651)	342 (755)	183 (403)
Ground	1405* (3098)	746* (1646)	503* (1109)	496* (1094)	335* (739)	1004 (2214)	561 (1238)	319 (704)	332 (731)	234 (516)	862 (1901)	456 (1006)	281 (619)	270 (595)	190 (418)
-1000 (-39.4)	1480* (3263)	799* (1761)		600* (1324)	416* (917)	1115 (2459)	561 (1238)		422 (930)	279 (616)	888 (1958)	465 (1025)		342 (755)	224 (495)

40258

* Rated Hydraulic Lift Capacity

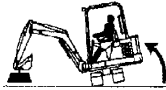
SW 99 6804687



ADVERTENCIA

LA SOBRECARGA PUEDE LADEAR LA EXCAVADORA Y CAUSAR LESIÓN O MUERTE

- No levantar o sostener ninguna carga que exceda estos valores nominales de carga y altura específica.
- La carga nominal total es mostrada. El peso de todos los mecanismos de levante deberá ser deducido para determinar la carga neta que puede ser levantada.

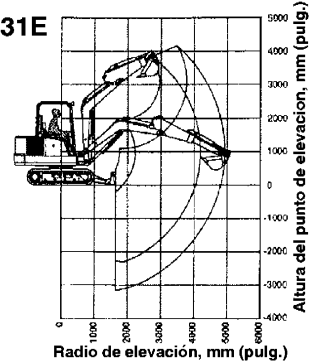


Donde se aplica, las especificaciones se ajustan a las normas ISO. Las especificaciones se hallan sujetas a modificaciones sin previo aviso. El punto de elevación es el punto de articulación del cucharón con el cucharón estándar puesto y el cilindro del cucharón totalmente extendido.

EXCAVADORA MODELO 331E

LARGO DE PESCANTE 2400mm (94.5 pulg)
LARGO DEL BRAZO
RECOGIDO 1196 mm (47.1 pulg)
EXTENDIDO 2019 mm (79.5 pulg)
CONTRAPESO 367.0 kg (809 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
CUCHARÓN ESTÁNDAR 609 mm (24.0 pulg)
97.5 kg (215 lbs.)

PRESIÓN DEL CIRCUITO
TRABAJANDO - 17.2 bar (2500 psi)
DETENIDA - 20.3 bar (2950 psi)



ALTURA DE PUNTO DE LEVANTE mm (pulg.)	CAPACIDAD NOMINAL DE ELEVACION SOBRE LA HOJA, HOJA BAJA-kg (lb)					CAPACIDAD NOMINAL DE ELEVACION SOBRE LA HOJA, HOJA ARRIBA-kg (lb)					CAPACIDAD NOMINAL DE ELEVACION LATERAL, HOJA ARRIBA-kg (lb)				
	RADIO DE LEVANTE					RADIO DE LEVANTE					RADIO DE LEVANTE				
	RECOGIDO BRAZO				EXTENDIDO BRAZO	RECOGIDO BRAZO				EXTENDIDO BRAZO	RECOGIDO BRAZO				EXTENDIDO BRAZO
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.		2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.		2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	
3000 (118.1)				317* (699)	185* (408)				308* (680)	184* (405)				313* (690)	192* (423)
2000 (78.7)		361* (795)	357* (787)	367* (809)	228* (502)		352* (776)	344* (758)	355* (782)	224* (494)		368* (811)	344* (759)	343* (756)	233* (513)
1000 (39.4)		568* (1252)	429* (946)	419* (924)	272* (599)		549* (1210)	410* (904)	319 (704)	266* (587)		564* (1244)	295 (651)	342 (755)	183 (403)
SUELO	1405* (3098)	746* (1646)	503* (1109)	496* (1094)	335* (739)	1004 (2214)	561 (1238)	319 (704)	332 (731)	234 (516)	862 (1901)	456 (1006)	281 (619)	270 (595)	190 (418)
-1000 (-39.4)	1480* (3263)	799* (1761)		600* (1324)	416* (917)	1115 (2459)	561 (1238)		422 (930)	279 (616)	888 (1958)	465 (1025)		342 (755)	224 (495)

40258

*Capacidad nominal de elevación hidráulica

SW 99 6804687



AVERTISSEMENT

UNE SURCHARGE PEUT FAIRE BASCULER L'EXCAVATEUR ET CAUSER AINSI DES BLESSURES OU LA MORT.

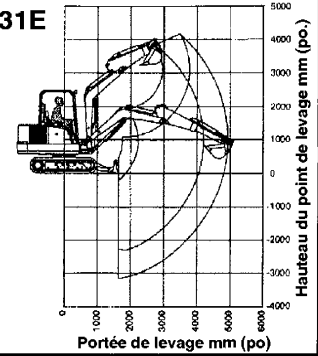
- Ne pas tenter de soulever ni de maintenir une charge supérieure aux valeurs nominales ci-dessous, à leurs hauteurs et vitesses de chargement respectives.
- Charge nominale totale indiquée. Il faut déduire de la charge nominale le poids de tous les accessoires de levage pour pouvoir déterminer la charge nette qui peut être soulevée.



Les caractéristiques sont conformes aux normes ISO, le cas échéant.
Les caractéristiques peuvent faire l'objet de changements sans préavis.
Le point de levée est situé à l'axe d'articulation du gond du godet (standard), le vérin de godet étant complètement sorti.

EXCAVATRICE MODÈLE 331E

LONGUEUR, FLÈCHE: 2400 mm (94.5 po)
LONGUEUR, BRAS DE GODET:
RETRAIDO 1196 mm (47.1 po)
ESTENDIDO 2019 mm (79.5 po)
CONTREPOIDS: 367.0 kg (809 lb)
X-CHANGE 24.9 kg (55 lbs.)
GODET STANDARD: 609 mm (24.0 po)
97.5 kg (215 lbs.)



PRESSION, CIRCUIT
DE SERVICE – 172 bar (2500 psi)
DE MAINTIEN – 203 bar (2950 psi)

HAUTEUR DE LEVÉE	CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME ABAISSÉ—kg (lb)						CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME levÉE—kg (lb)						CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE DU CÔTÉ, LAME LEVÉE—kg (lb)					
	RAYON DE LEVÉE						RAYON DE LEVÉE						RAYON DE LEVÉE					
	RETRAIDO BRAS DE GODET					ESTENDIDO BRAS DE GODET	RETRAIDO BRAS DE GODET					ESTENDIDO BRAS DE GODET	RETRAIDO BRAS DE GODET					ESTENDIDO BRAS DE GODET
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	MAX.		2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	MAX.		2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	MAX.	
3000 (118.1)				317* (699)	185* (408)					308* (680)	184* (405)					313* (690)	192* (423)	
2000 (78.7)		361* (795)	357* (787)	367* (809)	228* (502)			352* (776)	344* (758)	355* (782)	224* (494)			368* (811)	344* (759)	343* (756)	233* (513)	
1000 (39.4)		568* (1252)	429* (946)	419* (924)	272* (599)			549* (1210)	410* (904)	319 (704)	266* (587)			564* (1244)	295 (651)	342 (755)	183 (403)	
AU SOL	1405* (3098)	746* (1646)	503* (1109)	496* (1094)	335* (739)		1004 (2214)	561 (1238)	319 (704)	332 (731)	234 (516)		862 (1901)	456 (1006)	281 (619)	270 (595)	190 (418)	
-1000 (-39.4)	1480* (3263)	799* (1761)		600* (1324)	416* (917)		1115 (2459)	561 (1238)		422 (930)	279 (616)		888 (1958)	465 (1025)		342 (755)	224 (495)	

40258

*Capacité de levage hydraulique nominale

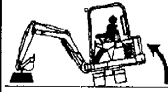
SW 99 6804687



WARNING

OVERLOAD CAN TIP THE EXCAVATOR
AND CAUSE INJURY OR DEATH

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

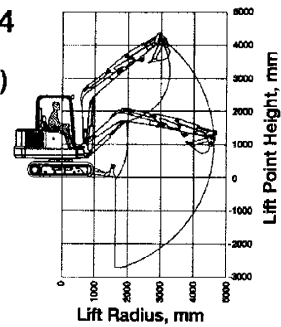


Where applicable, specifications conform to ISO Standards.
Specifications are subject to change without notice.
Lift Point is bucket hinge point with standard bucket attached
and bucket cylinder fully extended.

EXCAVATOR MODEL 334 (AND MODELS 331 OR 331E EQUIPPED WITH LONG ARM)

BOOM LENGTH 2400 mm (94.5 in.)
ARM LENGTH 1500 mm (59.1 in.)
COUNTERWEIGHT 208.5 kg (459 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
STANDARD BUCKET 609 mm (24.0 in.)
97.5 kg (215 lbs.)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				329* (726)				319* (703)				350* (772)
2000 (78.7)		413* (911)	401* (884)	410* (903)		392* (864)	364* (802)	248 (548)		419* (923)	316 (696)	262 (578)
1000 (39.4)	1217* (2684)	623* (1373)	470* (1037)	435* (960)	1124* (2478)	502 (1108)	331 (730)	242 (534)	856 (1887)	486 (1072)	290 (640)	243 (536)
Ground	1385* (3054)	792* (1747)	573* (1263)	520* (1147)	796 (1756)	480 (1058)	300 (661)	286 (630)	711 (1568)	437 (965)	291 (643)	257 (566)
-1000 (-39.4)	1460* (3219)	887* (1956)		655* (1445)	737 (1628)	497 (1097)		321 (707)	762 (1681)	444 (979)		309 (680)

40421

* Rated Hydraulic Lift Capacity

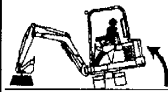
SW 99 6806616



ADVERTENCIA

LAS SOBRECARGAS PUEDEN VOLCAR LA
EXCAVADORA Y CAUSAR LESIONES O LA MUERTE

- No levante ni soporte cargas que superen estas capacidades nominales a los radios y alturas de carga especificados.
- La cifra indicada corresponde a la capacidad nominal total. Es necesario restar el peso de todos los dispositivos de elevación para determinar la carga neta que se ha de levantar.

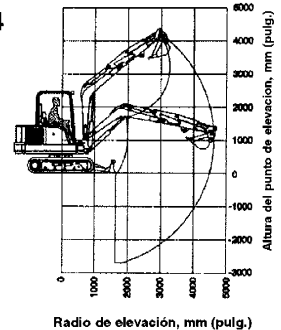


Donde corresponde, las especificaciones se ajustan a las normas ISO.
Las especificaciones están sujetas a cambios sin previo aviso.
El punto de elevación es el punto de articulación del cucharón con un
cucharón estándar instalado y el cilindro del cucharón totalmente
extendido.

EXCAVADORA MODELO 334

LARGO DE PESCANTE 2400mm (94.5 plg)
LARGO DEL BRAZO 1500 mm (59.1 plg)
CONTRAPESO 208.5 kg (459 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
CUCHARÓN ESTÁNDAR 609 mm (24.0 plg)
80 kg (176 lbs.)

PRESIÓN DEL CIRCUITO
TRABAJANDO - 172 bar (2500 psi)
DETENIDA - 203 bar (2950 psi)



ALTURA DE PUNTO DE LEVANTE	CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA HOJA, HOJA BAJA-kg (lb)				CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA HOJA, HOJA ARRIBA-kg (lb)				CAPACIDAD NOMINAL DE ELEVACIÓN LATERAL, HOJA ARRIBA-kg (lb)			
	RADIO DE LEVANTE				RADIO DE LEVANTE				RADIO DE LEVANTE			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				329* (726)				319* (703)				350* (772)
2000 (78.7)		413* (911)	401* (884)	410* (903)		392* (864)	364* (802)	248 (548)		419* (923)	316 (696)	262 (578)
1000 (39.4)	1217* (2684)	623* (1373)	470* (1037)	435* (960)	1124* (2478)	502 (1108)	331 (730)	242 (534)	856 (1887)	486 (1072)	290 (640)	243 (536)
SUELO	1385* (3054)	792* (1747)	573* (1263)	520* (1147)	796 (1756)	480 (1058)	300 (661)	286 (630)	711 (1568)	437 (965)	291 (643)	257 (566)
-1000 (-39.4)	1460* (3219)	887* (1956)		655* (1445)	737 (1628)	497 (1097)		321 (707)	762 (1681)	444 (979)		309 (680)

40421

* Capacidad de elevación hidráulica nominal

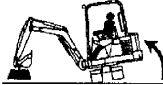
SW 99 6806616



AVERTISSEMENT

TOUTE SURCHARGE RISQUE DE FAIRE BASCULER L'EXCAVATRICE, PROVOQUANT DES BLESSURES GRAVES OU MORTELLES.

- Ne tentez pas de lever ni de maintenir des charges dont le poids dépasse ces valeurs nominales au-delà de la portée et de la hauteur spécifiées.
- La charge nominale totale est indiquée. Pour déterminer la charge nette pouvant être levée, déduisez le poids de tous les dispositifs de levage.

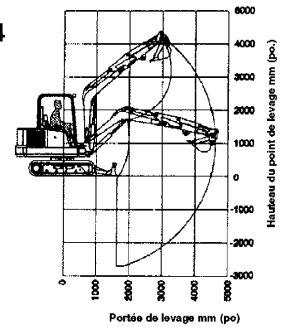


Donde corresponde, las especificaciones se ajustan a las normas ISO. Las especificaciones están sujetas a cambios sin previo aviso.
El punto de elevación es el punto de articulación del cucharón con un cucharón estándar instalado y el cilindro del cucharón totalmente extendido.

EXCAVATRICE MODÈLE 334

LONGUEUR, FLÈCHE: 2400 mm (94.5 po)
LONGUEUR, BRAS DE
GODET: 1500 mm (59.1 po)
CONTREPOIDS: 208.5 kg (459 lb)
X-CHANGE 24.9 kg (55 lbs.)
GODET STANDARD: 609 mm (24.0 po)
97.5 kg (215 lbs)

PRESSION, CIRCUIT
DE SERVICE - 172 bar (2500 psi)
DE MAINTIEN - 203 bar (2950 psi)



HAUTEUR DE LEVÉE mm (po.)	CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME ABAISSÉ-kg (lb)				CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME levée-kg (lb)				CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE DU CÔTÉ, LAME LEVÉE-kg (lb)			
	RAYON DE LEVÉE				RAYON DE LEVÉE				RAYON DE LEVÉE			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				329* (726)				319* (703)				350* (772)
2000 (78.7)		413* (911)	401* (884)	410* (903)		392* (864)	364* (802)	248 (548)		419* (923)	316 (696)	262 (578)
1000 (39.4)	1217* (2684)	623* (1373)	470* (1037)	435* (960)	1124* (2478)	502 (1108)	331 (730)	242 (534)	856 (1887)	486 (1072)	290 (640)	243 (536)
AU SOL	1385* (3054)	792* (1747)	573* (1263)	520* (1147)	796 (1756)	480 (1058)	300 (661)	286 (630)	711 (1568)	437 (965)	291 (643)	257 (566)
-1000 (-39.4)	1460* (3219)	887* (1956)		655* (1445)	737 (1626)	497 (1097)		321 (707)	762 (1681)	444 (979)		309 (680)

40421

* Capacité de levage hydraulique nominale

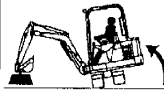
SW 99 6806616



WARNING

OVERLOAD CAN TIP THE EXCAVATOR
AND CAUSE INJURY OR DEATH

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

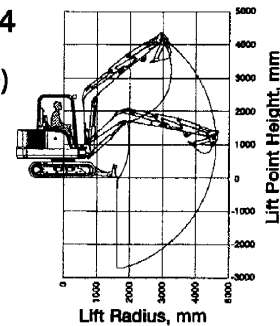


Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 334 (AND MODELS 331 OR 331E EQUIPPED WITH LONG ARM)

BOOM LENGTH 2400 mm (94.5 in.)
ARM LENGTH 1500 mm (59.1 in.)
COUNTERWEIGHT 367.0 kg (810 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
STANDARD BUCKET 609 mm (24.0 in.)
97.5 kg (215 lbs.)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)			354* (781)	362* (797)			343* (756)	345* (761)			358* (790)	363* (800)
2000 (78.7)			404* (891)	420* (926)			386* (850)	327 (721)			411* (905)	303 (668)
1000 (39.4)	1261* (2780)	668* (1473)	506* (1116)	482* (1063)	949 (2093)	635* (1401)	479* (1055)	293 (646)	1216* (2680)	567* (1251)	358 (790)	280 (618)
Ground	1620* (3572)	1258* (2773)	613* (1351)	548* (1208)	1136 (2506)	623* (1374)	361 (796)	306 (676)	1011 (2230)	550 (1214)	352 (777)	299 (659)
-1000 (-39.4)	1884* (4153)	996* (2197)	637* (1405)	637* (1405)	1237 (2729)	613 (1353)	361 (796)	361 (796)	1025 (2260)	546 (1204)	350 (772)	350 (772)

40421

* Rated Hydraulic Lift Capacity

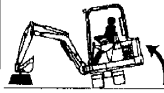
SW 99 6805626



ADVERTENCIA

LAS SOBRECARGAS PUEDEN VOLCAR LA
EXCAVADORA Y CAUSAR LESIONES O LA
MUERTE

- No levante ni soporte cargas que superen estas capacidades nominales a los radios y alturas de carga especificados.
- La cifra indicada corresponde a la capacidad nominal total. Es necesario restar el peso de todos los dispositivos de elevación para determinar la carga neta que se ha de levantar.

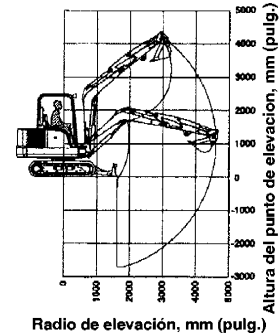


Donde corresponde, las especificaciones se ajustan a las normas ISO. Las especificaciones están sujetas a cambios sin previo aviso. El punto de elevación es el punto de articulación del cucharón con un cucharón estándar instalado y el cilindro del cucharón totalmente extendido.

EXCAVADORA MODELO 334

LARGO DEL PESCANTE
2400 mm (94.5 pulg.)
LARGO DEL BRAZO 1500 mm (59.1 pulg.)
CONTRAPESO 367.0 kg (810 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
CUCHARÓN ESTÁNDAR 609 mm
(24.0 pulg.)
97.5 kg (215 lbs.)

PRESIONES DEL CIRCUITO
DE TRABAJO 172 bar (2500 psi)
DE SOPORTE 203 bar (2950 psi)



Altura del punto de elevación	CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE CUCHILLA, CUCHILLA BAJA - kg (lbs.)				CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA CUCHILLA, CUCHILLA ARRIBA - kg (lbs.)				CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LADO, CUCHILLA ARRIBA - kg (lbs.)			
	Radio de elevación, mm (pulg.)				Radio de elevación, mm (pulg.)				Radio de elevación, mm (pulg.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)			354* (781)	362* (797)			343* (756)	345* (761)			358* (790)	363* (800)
2000 (78.7)			404* (891)	420* (926)			386* (850)	327 (721)			411* (905)	303 (668)
1000 (39.4)	1261* (2780)	668* (1473)	506* (1116)	482* (1063)	949 (2093)	635* (1401)	479* (1055)	293 (646)	1216* (2680)	567* (1251)	358 (790)	280 (618)
SUELO	1620* (3572)	1258* (2773)	613* (1351)	548* (1208)	1136 (2506)	623* (1374)	361 (796)	306 (676)	1011 (2230)	550 (1214)	352 (777)	299 (659)
-1000 (-39.4)	1884* (4153)	996* (2197)	637* (1405)	637* (1405)	1237 (2729)	613 (1353)	361 (796)	361 (796)	1025 (2260)	546 (1204)	350 (772)	350 (772)

40421

*Capacidad nominal de elevación hidráulica

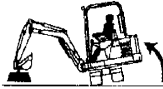
SW 99 6805626



AVERTISSEMENT

TOUTE SURCHARGE RISQUE DE FAIRE BASCULER L'EXCAVATRICE, PROVOQUANT DES BLESSURES GRAVES OU MORTELLES.

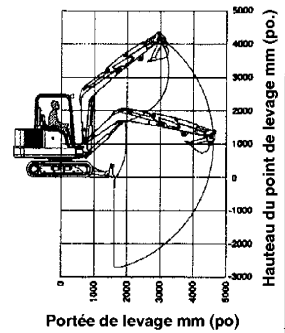
- Ne tentez pas de lever ni de maintenir des charges dont le poids dépasse ces valeurs nominales au-delà de la portée et de la hauteur spécifiées.
- La charge nominale totale est indiquée. Pour déterminer la charge nette pouvant être levée, déduisez le poids de tous les dispositifs de levage.



Les spécifications sont conformes aux normes ISO, là où elles s'appliquent. Elles sont sujettes à modification sans préavis. Le point de levage se trouve au point charnière du godet, le godet standard étant fixé et le vérin de godet complètement sorti.

EXCAVATRICE MODÈLE 334

LONGUEUR DE LA FLÈCHE 2400 mm (94.5 po)
 LONGUEUR DU BRAS 1500 mm (59.1 po)
 CONTREPOIDS 367.0 kg (810 lb)
 X-CHANGE 24.9 kg (55 lbs.)
 GODET STANDARD 609 mm (24.0 po)
 97.5 kg (215 lb)
 PRESSIONS DE CIRCUIT
 FONCTIONNEMENT 172 bar (2500 psi)
 ATTENTE 203 bar (2950 psi)



Hauteur du point de levage mm (po.)	CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME ABAISSÉE - kg (lb.)				CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DE LA LAME, LAME LEVÉE - kg (lb.)				CAPACITÉ DE LEVAGE NOMINALE AU-DESSUS DU CÔTÉ, LAME LEVÉE - kg (lb.)			
	Portée de levage mm (po)				Portée de levage mm (po)				Portée de levage mm (po)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)			354* (781)	362* (797)			343* (756)	345* (761)			358* (790)	363* (800)
2000 (78.7)			404* (891)	420* (928)			386* (850)	327 (721)			411* (905)	303 (668)
1000 (39.4)	1261* (2780)	668* (1473)	506* (1116)	482* (1063)	949 (2093)	635* (1401)	479* (1055)	293 (646)	1216* (2680)	567* (1251)	358 (790)	280 (618)
AU SOL	1620* (3572)	1258* (2773)	613* (1351)	548* (1208)	1136 (2506)	623* (1374)	361 (796)	306 (676)	1011 (2230)	550 (1214)	352 (777)	299 (659)
-1000 (-39.4)	1884* (4153)	996* (2197)	637* (1405)	637* (1405)	1237 (2729)	613 (1353)	361 (796)	361 (796)	1025 (2260)	546 (1204)	350 (772)	350 (772)

40421

*Capacité de levage hydraulique nominale

SW 99 6805626

SERVICE SCHEDULE

(See operator's Manual for Instructions & Specifications)

EVERY 8-10 HOURS

1. Check engine coolant level.
2. Check engine oil level.
3. Check hydraulic fluid level.
4. Check air cleaner condition indicator.
5. Check & adjust track tension.
6. Check indicator lights for correct operation.
7. Check cab / canopy condition & mounting hardware.
8. Check seat belt condition & mounting hardware.
9. Check for damaged signs (decals) - Replace as needed.
10. Grease all machinery pivot points.
11. Apply grease to slide on extendible arm (if equipped).

EVERY 50 HOURS

12. Grease swing pinion & swing circle (3 places).
13. Drain water & sediment from fuel tank & fuel filter.
14. Replace engine oil and filter (at first 50 hours).
15. Check condition of fan belt (at first 50 hours).
16. Check battery cables and electrolyte level.

EVERY 100 HOURS

17. Check & adjust the fan belt if required.
18. Spark Arrestor Muffler - Clean spark chamber.
19. Replace hydraulic filter (at first 100 hours).
20. Replace oil in both final drive cases (at first 100 hours).
21. Replace case drain hydraulic filter (at first 100 hours).

EVERY 250 HOURS

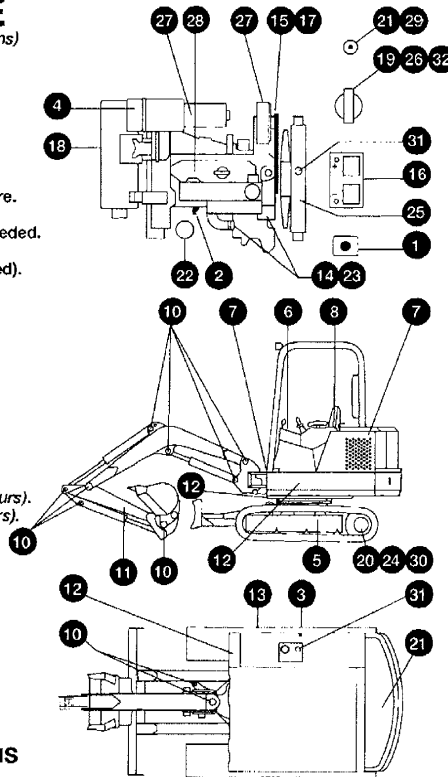
22. Replace diesel fuel filter.
23. Replace engine oil and filter.
24. Check oil level in both final drive cases.

EVERY 500 HOURS

25. Clean radiator fins.
26. Replace hydraulic filter.
27. Check alternator & starter connections.
28. Check & adjust engine valve clearance.
29. Replace case drain hydraulic filter.

EVERY 1000 HOURS or EVERY 6 MONTHS

30. Replace oil in both final drive cases.
31. Drain & flush cooling system - Replace coolant.
32. Replace hydraulic fluid & filter - Clean reservoir.



39929

SW 99 6804326

PROGRAMA DE SERVICIO (SPANISH)

(Ver el Manual del operador para instrucciones y especificaciones)

8-10 HORAS

1. Verificar el nivel del refrigerante del motor.
2. Verificar el nivel de aceite del motor.
3. Verificar el nivel del fluido hidráulico.
4. Verificar la condición del indicador del depurador de aire.
5. Verificar y ajustar la tensión de la oruga.
6. Verificar la correcta operación de las luces indicadoras.
7. Verificar la condición de la cabina/cubierta y de la ferretería de montaje.
8. Verificar la condición del cinturón de seguridad y la ferretería de montaje.
9. Verificar si hay daños en las señales (calcomanías). Reemplazar según sea necesario.
10. Engrasar todos los puntos de pivote de la maquinaria

CADA 50 HORAS

12. Engrasar el piñón de giro y el círculo de giro (3 lugares).
13. Drenar el agua y sedimento del tanque de combustible y filtro de combustible.
14. Reemplazar el aceite del motor y el filtro (a las primeras 50 horas).
15. Verificar la condición de la correa del ventilador (a las primeras 50 horas).
16. Examinar la batería, los cables y el nivel del electrolito.

CADA 100 HORAS

17. Verificar y ajustar la correa del ventilador, si es necesario.
18. Cámara de chispas del silenciador. Limpiar la cámara de chispas.
19. Reemplazar el filtro hidráulico (a las primeras 100 horas).
20. Reemplazar aceite en ambas cajas de cadena (mando final) (a las primeras 100 horas).
21. Reemplazar el filtro de la caja de drenaje hidráulico (a las primeras 100 horas).

CADA 250 HORAS

22. Reemplazar el filtro del combustible diesel.
23. Reemplazar el aceite del motor y el filtro.
24. Verificar el nivel de aceite en ambas cajas de cadena (mando final).

CADA 500 HORAS

25. Limpiar las aletas de radiador.
26. Reemplazar el filtro hidráulico.
27. Verificar las conexiones del alternador y el motor de arranque.
28. Verificar y ajustar la distancia entre las válvulas del motor.
29. Reemplazar el filtro de la caja de drenaje hidráulico.

CADA 1000 HORAS o CADA 6 MESES

30. Reemplazar el aceite en ambas cajas de cadena (mando final).
31. Drenar y lavar el sistema de enfriamiento. Reemplazar el refrigerante.
32. Reemplazar el fluido hidráulico y el filtro. Limpiar el depósito.

PLAN D'ENTRETIEN (FRENCH)

(Voir les directives et les caractéristiques techniques dans le Manuel de l'opérateur.)

TOUTES LES 8–10 HEURES

1. Vérifier le niveau de liquide de refroidissement.
2. Vérifier le niveau d'huile moteur.
3. Vérifier le niveau d'huile hydraulique.
4. Vérifier l'état du collecteur de poussière du filtre à air.
5. Vérifier et régler la tension des chenilles.
6. Vérifier le bon fonctionnement des lampes-témoins.
7. Vérifier le serrage de la boulonnerie ainsi que l'état de la cabine ou de l'auvent.
8. Vérifier l'état de la ceinture de sécurité et si ses dispositifs de fixation sont bien serrés.
9. Vérifier si les autocollants sont endommagés. Les remplacer s'il y a lieu.
10. Graisser tous les axes d'articulation de l'outillag.

TOUTES LES 50 HEURES

12. Graisser le pignon et la couronne de rotation (3 points).
13. Drainer l'eau et les sédiments du réservoir à carburant et du filtre à carburant.
14. Remplacer l'huile moteur et le filtre à huile moteur (aux premières 50 heures).
15. Vérifier l'état de la courroie de ventilateur (aux premières 50 heures).
16. Vérifier l'état de la batterie et des câbles, de même que le niveau d'électrolyte.

TOUTES LES 100 HEURES

17. Vérifier la courroie de ventilateur et la régler s'il y a lieu.
18. Nettoyer la chambre à étincelles du silencieux pare-étincelles (si la machine est ainsi équipée).
- 18
19. Remplacer le filtre à huile hydraulique (aux premières 100 heures).
20. Remplacer l'huile des deux carters de transmission finale (aux premières 100 heures).
21. Remplacer le filtre à huile hydraulique du drain du carter (aux premières 100 heures).

TOUTES LES 250 HEURES

22. Remplacer le filtre à carburant diesel.
23. Remplacer l'huile moteur et le filtre à huile.
24. Vérifier le niveau de l'huile des deux carters de transmission finale.

TOUTES LES 500 HEURES

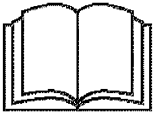
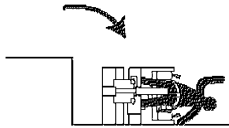
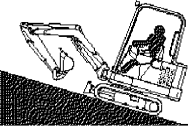
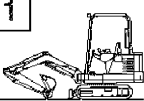
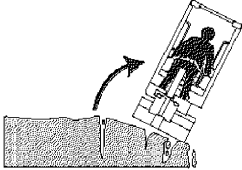
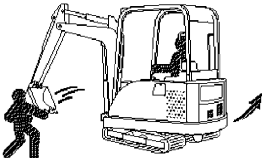
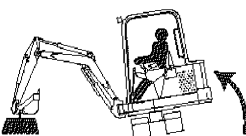
25. Nettoyer les ailettes du radiateur.
26. Remplacer le filtre à huile hydraulique.
27. Vérifier les connexions de l'alternateur et du démarreur.
28. Vérifier et régler le jeu des soupapes du moteur.
29. Remplacer le filtre à huile hydraulique du drain du carter.

TOUTES LES 1000 HEURES OU TOUS LES 6 MOIS

30. Remplacer l'huile des deux carters de transmission finale.
31. Vidanger et rincer le circuit de refroidissement – Remplacer le liquide de refroidissement.
32. Remplacer l'huile hydraulique et le filtre à huile hydraulique – Nettoyer le réservoir.

WARNING

AVOID INJURY OR DEATH

 Never use Excavator without instructions. Read Operation and Maintenance Manual and Handbook.	 Always use cab/canopy. Never modify equipment or use attachments not approved by Melroe Company.	 Check for overhead or underground lines before operating.	 On slopes, keep heavy end uphill. Do not travel or turn with attachment extended.	TO LEAVE THE EXCAVATOR: 1  Lower attachment. Never park with tracks pointed down hill. 2  Stop the engine.
 Fasten seat belt securely. Operate controls only from operator's position. 39894	 Keep away from drop-offs. Avoid steep areas or banks that could break away.	 Keep bystanders away. No riders. Check location of blade for direction of travel before moving steering controls.	 When swinging loads: ● Keep load low. ● Swing slowly. ● Do not exceed lift capacity. Read lift capacity chart.	Weitere Instruktionen finden sie in der Bedienungsanleitung. Consulte el Manual del Operador por mas instrucciones. Se reporter au manual de l'opérateur pour plus de renseignements. SW 98 6804230

ADVERTENCIA (SPANISH)

EVITE LESIONES O LA MUERTE

Nunca use la excavadora sin instrucciones.
Lea el Manual de operación y mantenimiento y la Guía del operador.

Use siempre la cabina/el toldo.
Nunca modifique los equipos ni use implementos no aprobados por Melroe Company.

Verifique que no haya conductos elevados o subterráneos antes de operar.

Mantenga el extremo pesado cuesta arriba en las pendientes.
No se desplace ni haga girar el cargador con el implemento extendido.

PARA SALIR DE LA EXCAVADORA:

1. Baje el implemento.
2. Nunca estacione la unidad con las orugas cuesta abajo.

Apague el motor.

Ajústese bien el cinturón de seguridad.
Opere los controles desde la posición del operador solamente.

Evite las pendientes empinadas.
Evite las áreas o taludes escarpados que pueden ceder.

Mantenga a los transeúntes alejados.
No lleve pasajeros.
Verifique la ubicación de la hoja para determinar la dirección de desplazamiento antes de mover los controles de dirección.

Al hacer girar cargas:

- Mantenga la carga baja.
- Hágala girar lentamente.
- No exceda la capacidad de levante. Lea el diagrama de capacidades de levante.

AVERTISSEMENT (FRENCH)

RISQUE DE BLESSURES OU DE MORT

N'utilisez jamais l'excavatrice sans prendre connaissance des instructions. Veuillez lire les manuels de l'opérateur et d'entretien.

Utilisez toujours la cabine ou l'auvent.
Ne modifiez jamais le matériel et n'utilisez pas d'accessoires qui ne sont pas approuvés par Melroe Company.

Avant d'utiliser la machine, vérifiez l'emplacement des conduits et lignes en hauteur ou souterrains.

Sur les pentes, gardez l'extrémité lourde en amont.
Ne déplacez pas la machine et ne la faites pas tourner lorsque l'accessoire est étendu.

AVANT DE QUITTER L'EXCAVATRICE:

1. Abaissez l'accessoire.
2. Ne garez jamais la machine avec les chenilles dirigées vers l'aval.

Arrêtez le moteur.

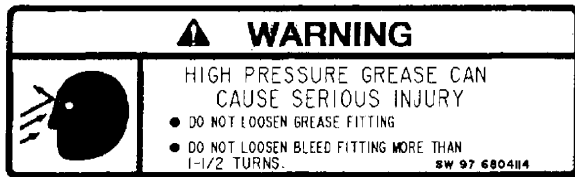
Bouclez la ceinture de sécurité.
N'utilisez les commandes que depuis le poste de commande.

N'approchez pas de pentes abruptes.
Évitez les déclivités et les talus pouvant s'effondrer.

Ne laissez personne s'approcher.
Ne prenez pas de passagers.
Vérifiez l'emplacement de la lame pour le sens de déplacement avant d'actionner les commandes de direction.

Lors du pivotement de charges ::

- Maintenez la charge basse.
- Pivotez lentement.
- Ne dépassez pas la capacité de levage. Consultez le tableau de capacité de levage.



ADVERTENCIA (SPANISH)

EVITE UN ACCIDENTE QUE PUEDE SER MORTAL

No afloje el engrasador más de 1–1/2 vuelta.

No afloje ninguna otra pieza. Está cargado con grasa a presión.

AVERTISSEMENT (FRENCH)

EVITER DES BLESSURES OU LA MORT

Ne pas desserrer le graisseur de plus de 1–1/2 tour.

Ne pas desserrer une pièce autre que le graisseur. La graisse se trouve sous haute pression.



ADVERTENCIA (SPANISH)

EL CILINDRO CONTIENE GAS BAJO ALTA PRESION. EL ABNRRIR EL CILINDRO PUEDE SOLTAR LA VARILLA Y CAUSAR HERIDAS O LA MUERTE.

AVERTISSEMENT (FRENCH)

LES VERINS RENFERMENT UN GAZ SOUS PRESSION. NE JAMAIS OUVRIR UN VERIN CAR LA TIGE RISQUE DE S'ECHAPPER BRUTALEMENT ET DE CAUSER DES BLESSURES OU MEME LA MORT.



ADVERTENCIA (SPANISH)

Las superficies calientes pueden causar lesiones serias.

No toque.

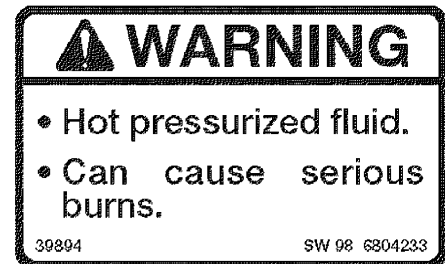
Permita que se enfríe antes de realizar tareas de mantenimiento.

AVERTISSEMENT (FRENCH)

Risque de brûlures graves sur les surfaces brûlantes.

Ne touchez pas.

Laissez refroidir avant l'entretien.



ADVERTENCIA (SPANISH)

- Fluido presurizado caliente.
- Puede provocar quemaduras graves.

AVERTISSEMENT (FRENCH)

- Fluide brûlant sous pression.
- Risque de brûlures graves.



Bobcat®

ADDITIONAL PUBLICATIONS AND TRAINING MATERIALS	96
BOBCAT APPROVED ATTACHMENTS & ACCESSORIES	94
BUCKET SPECIFICATIONS	93
COOLANT MIXTURE	92
ENGINE OIL SPECIFICATIONS	92
FUEL, COOLANT AND LUBRICANTS	
Chart	92
HYDRAULIC EXCAVATOR SPECIFICATIONS 331 (S/N 512915200 & Above)	
Brakes	85
Capacities	85
Controls	84
Digging Force	85
Drive System	85
Electrical	84
Engine	84
Hydraulic Cylinders	85
Hydraulic System	85
Lifting Capacity	84
Machine Dimensions	83
Std. Track	85
Swing System	85
Undercarriage	85
Weights	84
HYDRAULIC EXCAVATOR SPECIFICATIONS 331E (S/N 517711001 & Above)	
Brakes	88
Capacities	88
Controls	87
Digging Force	88
Drive System	88
Electrical	87
Engine	87
Hydraulic Cylinders	88
Hydraulic System	88
Lifting Capacity	87
Machine Dimensions	86
Std. Track	88
Swing System	88
Undercarriage	88
Weights	87

SPECIFICATIONS

Continued On Next Page

HYDRAULIC EXCAVATOR SPECIFICATIONS 334 (S/N 516711001 & Above)

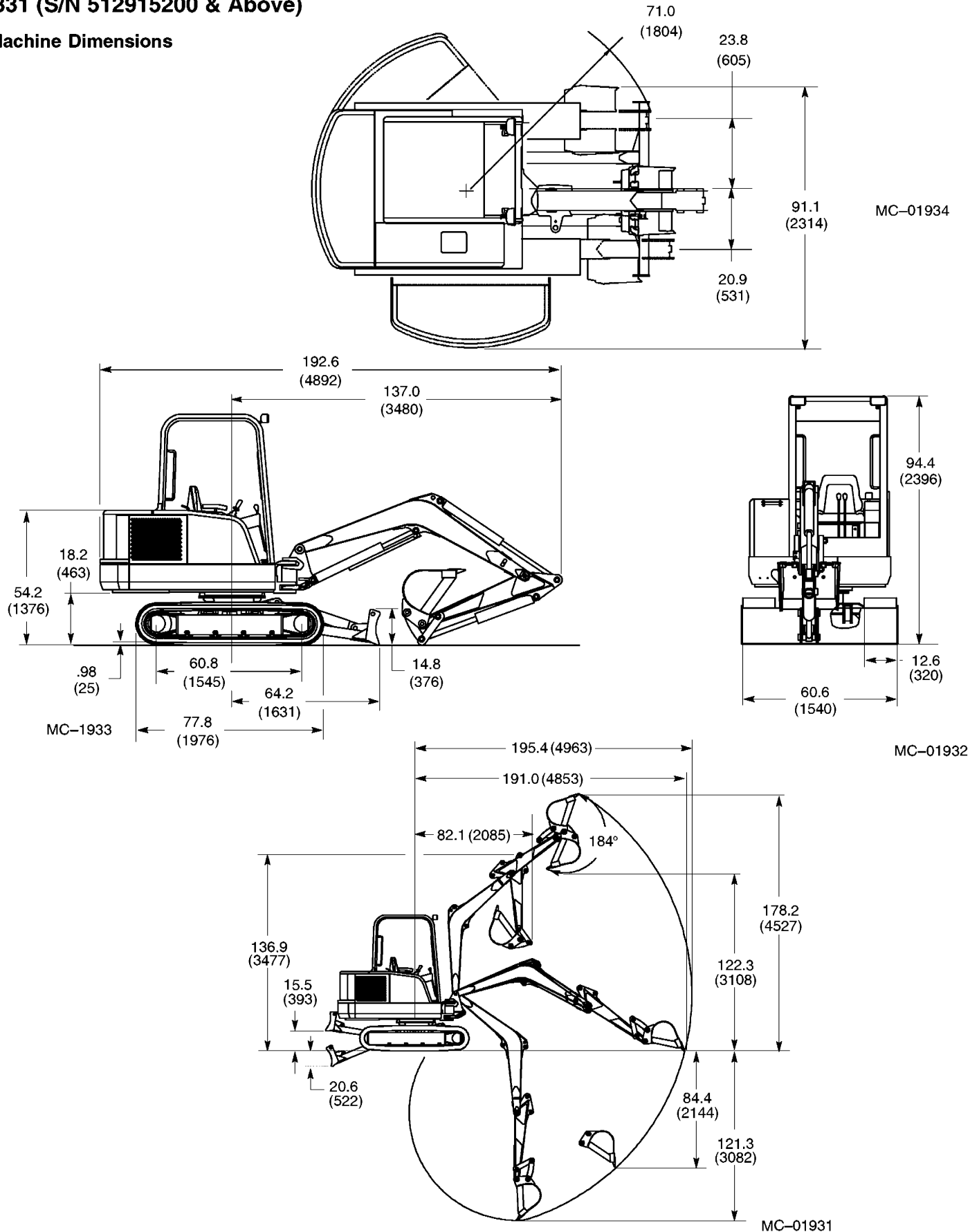
Brakes	91
Capacities	91
Controls	90
Digging Force	91
Drive System	91
Electrical	90
Engine	90
Hydraulic Cylinders	91
Hydraulic System	91
Lifting Capacity	90
Machine Dimensions	89
Std. Track	91
Swing System	91
Undercarriage	91
Weights	90

HYDRAULIC EXCAVATOR SPECIFICATIONS

331 (S/N 512915200 & Above)

Machine Dimensions

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



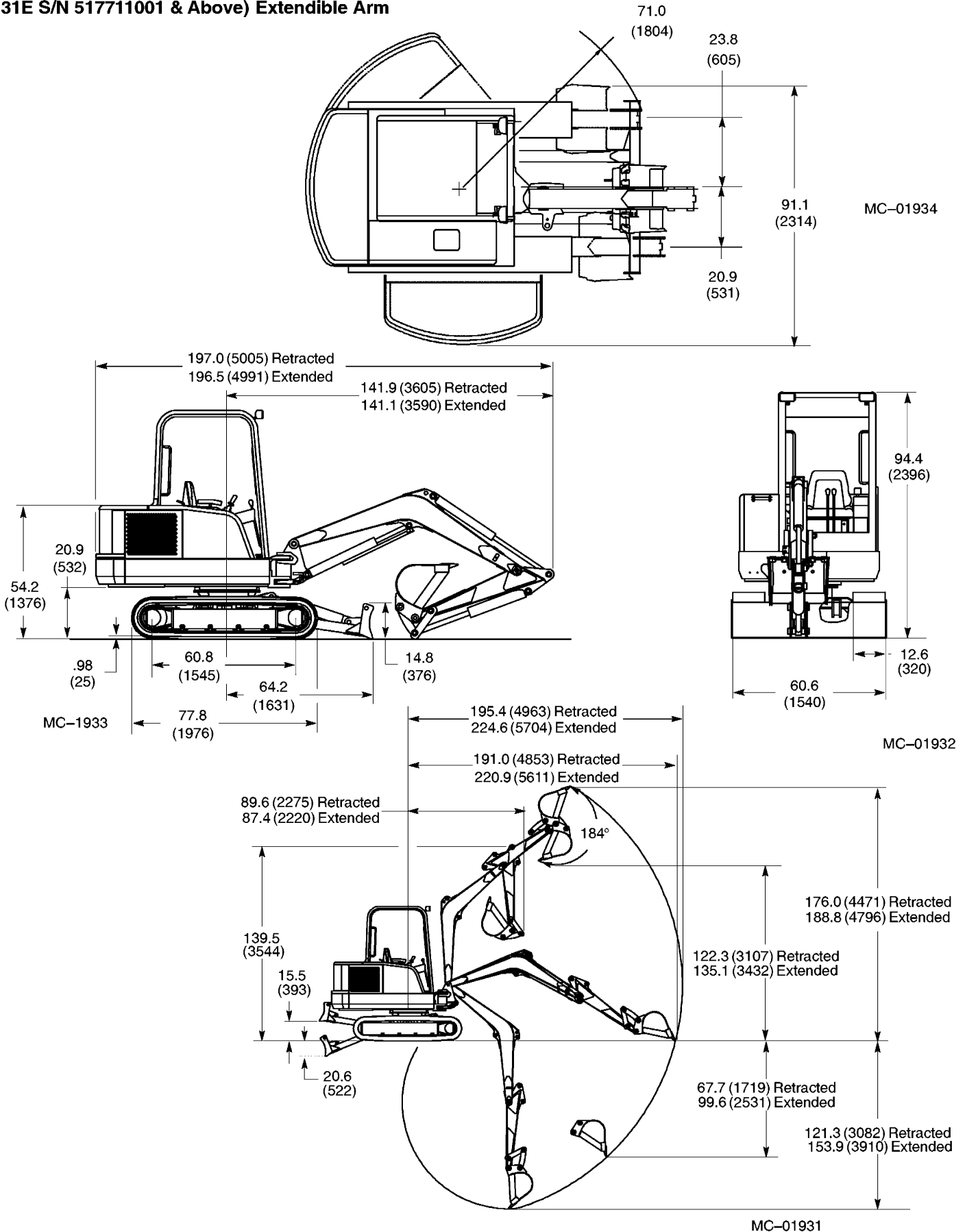
HYDRAULIC EXCAVATOR SPECIFICATIONS 331 (S/N 512915200 & Above) (Cont'd)

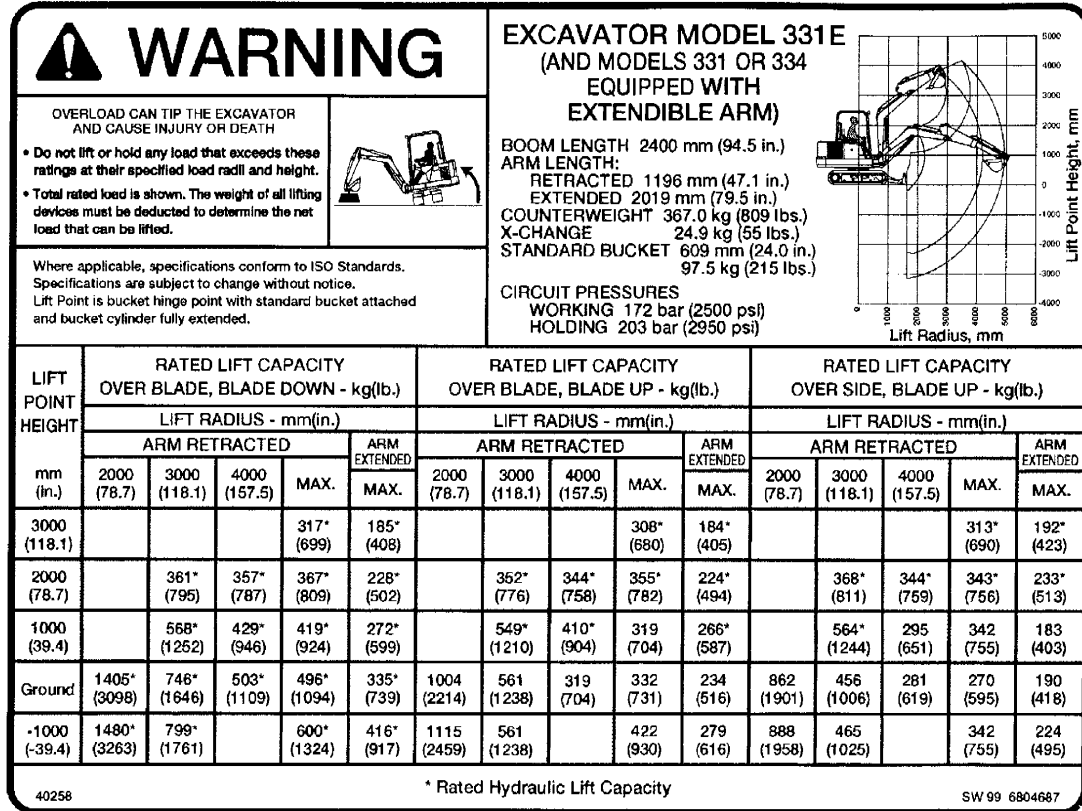
331	
HYDRAULIC SYSTEM	
Number of Pumps	Three
Type	Triple Section Gear Pump
Capacity	1 x 8.9 GPM (33,6 LPM) 2 x 7.6 GPM (28.8 LPM)
System Relief Setting	
Main Relief Circuits	2700 PSI (18617 kPa), 2800 PSI (19306 kPa), 2850 PSI (19651 kPa), 4100 PSI (28270 kPa), 3700 PSI (25512 kPa) 1700 PSI (11721 kPa)
Travel Circuits	16.5 GPM (62.4 L/min.)
Swing Circuits	5 Spool Parallel & Series
Auxiliary Flow	Two Axial Piston
Control Valve(s)	Orbit Motor
Drive Motors	
Swing Motor	
Hydraulic Function Time	
Bucket	Curl 2.5 Sec. Dump 1.8 Sec.
Arm	Retract 4.7 Sec. Extend 3.3 Sec.
Boom	Raise 3.7 Sec. Lower 4.8 Sec.
Boom Swing	Left 5.4 Sec. Right 6.0 Sec.
Blade	Raise 2.0 Sec. Lower 2.1 Sec.
SWING SYSTEM	
Swing Drive	Orbit Motor Connected to a Direct Drive
Swing Circle	Single Row Shear Type Ball Bearings with Internal Gear Built into Swing Circle
Swing Speed	9.3 RPM
HYDRAULIC CYLINDERS	
	Bore Dia. in. (mm) Rod Dia in. (mm) Stroke in. (mm)
Boom (cushion up)	3.25 (83) 1.75 (44) 25.31 (643)
Arm (cushion retract, extend)	3.00 (76) 1.75 (44) 23.62 (600)
Bucket	3.25 (83) 2.00 (51) 18.39 (467)
Boom swing (cushion left and right)	3.00 (76) 1.50 (38) 20.67 (525)
Blade	3.50 (89) 1.75 (44) 7.28 (185)
DRIVE SYSTEM	
Final Drive	Each Track is Driven by a Hydrostatic Axial Piston Motor
Type of Reduction	Two Stage Planetary Gear Reduction 36.4:1
Max. Drawbar Pull	7100 lbs. (3227 kg)
Gradability	30°
BRAKES	
Travel	
Service	Hydraulic Lock on Motor
Parking	Hydraulic Lock on Motor
Swing	
Service	Hydraulic Lock on Motor
Holding	Pin Lock
UNDERCARRIAGE	
Type	Crawler-Tractor Design Undercarriage. Sealed Track Rollers with Reinforced Box-Section Track Roller Frame. Grease Type Track Adjusters with Shock Absorbing Recoil Springs.
STD TRACK	
Type	Rubber
Width	12.6" (320 mm)
No. of Shoes	Single Assembly
No. of Track Rollers	4 each
Ground Pressure	4.52 PSI (31.2 kPa)
CAPACITIES	
Fuel Tank	14.4 gal. (54,5 L)
Radiator	4.0 gal. (15,1 L)
Engine Oil & Filter	7.5 qts. (7,1 L)
Hydraulic Reservoir	10.6 gal. (40 L)
DIGGING FORCE	
Arm	3600 lbf. (16013 N)
Bucket	7000 lbf. (31136 N)

HYDRAULIC EXCAVATOR SPECIFICATIONS

Machine Dimensions (331E S/N 517711001 & Above) Extendible Arm

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



HYDRAULIC EXCAVATOR SPECIFICATIONS 331E (S/N 517711001 & Above) (Cont'd)**Lifting Capacity****WEIGHTS**

Operating Weight (Includes Standard Equipment and 20" Bucket) – W/Rubber Tracks
 W/Steel Tracks
 W/Counterweight

Travel Speed

Lo
 High

CONTROLS

Vehicle
 Excavator Functions

ENGINE

Make
 Model
 Fuel
 Horsepower
 Maximum Governed RPM (Full Load)
 Torque
 No. of Cylinders
 Displacement
 Bore x Stroke
 Lubrication
 Filter
 Air Cleaner

ELECTRICAL

Alternator
 Battery
 Starter

331E**WITH CANOPY**

7789 lbs. (3533 kg)
 7947 lbs. (3605 kg)
 Add 350 lbs. (159 kg)

WITH CAB

8049 lbs. (3651 kg)
 8207 lbs. (3723 kg)
 Add 350 lbs. (159 kg)

1.28 MPH (2.06 km/hr.)
 3.45 MPH (5.55 km/hr.)

Two Hand or Foot Levers
 Two hydraulic joysticks control boom, dipperstick, bucket and cab swing. Two foot pedals control boom swing and Aux. Hyd. The blade is controlled by a separate lever.

Kubota
 V2203-E
 Diesel
 40 HP (29.9 Kw) @ 2400 RPM
 2525 RPM
 102.5 ft.-lbs. (139 Nm) @ 1600 RPM
 Four
 134 cu.-in. (2.1 L)
 3.42" (87 mm) x 3.64" (92.4 mm)
 Forced
 Cartridge Type – Full Flow
 Dry replaceable paper cartridge

12 Volt, 50 Amps.
 12 Volt, 500 Cold Crank Amps. @ -18° C (0° F)
 75 minute reserve capacity
 12 Volt (2.7 kW) Reduction Drive

HYDRAULIC EXCAVATOR SPECIFICATIONS 331E (S/N 517711001 & Above) (Cont'd)

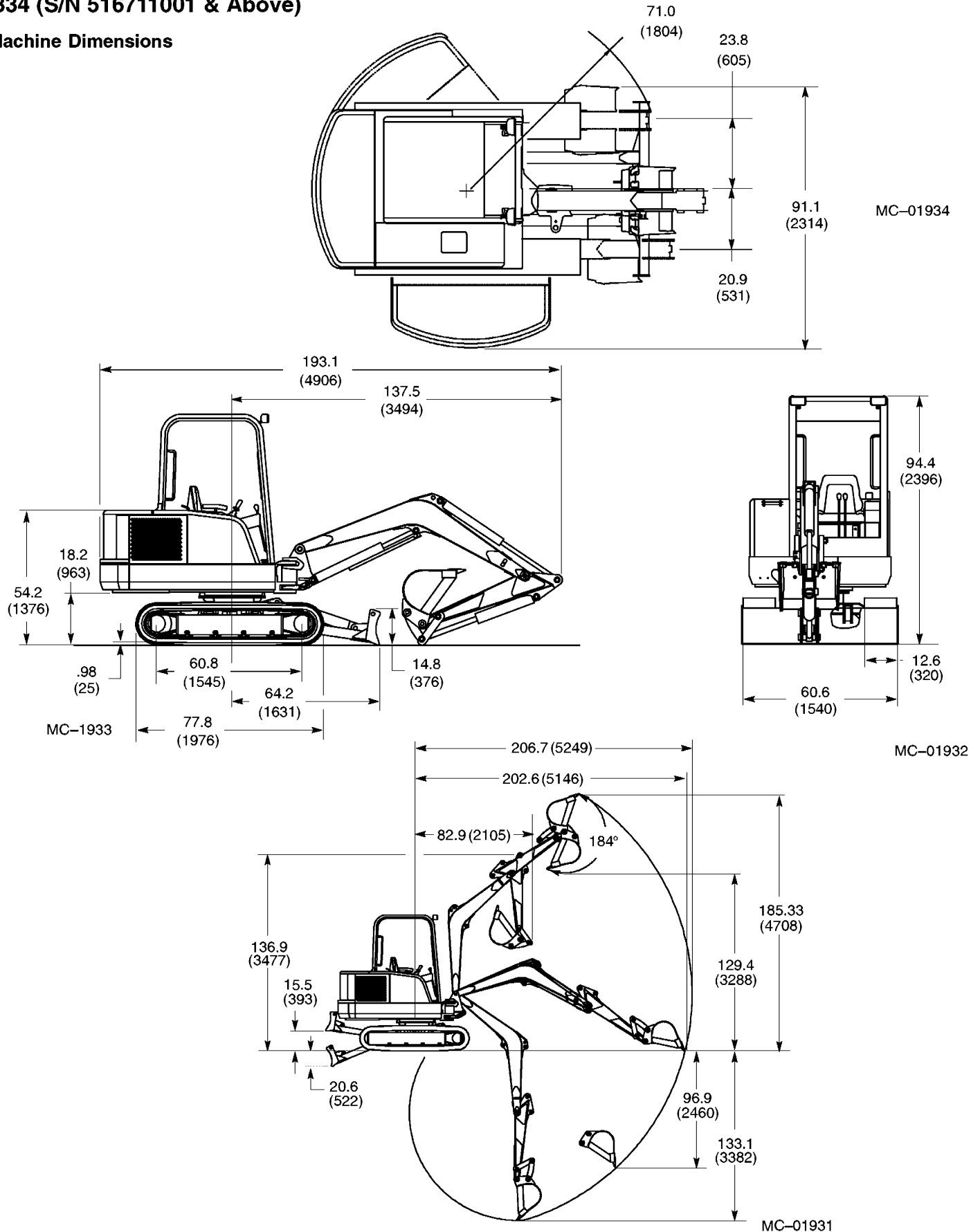
331E	
HYDRAULIC SYSTEM	
Number of Pumps	Three
Type	Triple Section Gear Pump
Capacity	1 x 8.9 GPM (33,6 LPM) 2 x 7.6 GPM (28.8 LPM)
System Relief Setting	2500 PSI (17235 kPa)
Implement Circuits	2700 PSI (18617 kPa), 2800 PSI (19306 kPa), 2850 PSI (19651 kPa), 4100 PSI (28270 kPa), 3500 PSI (24131 kPa)
Travel Circuits	1700 PSI (11721 kPa)
Swing Circuits	16.5 GPM (62.4 L/min.)
Auxiliary Flow	5 Spool Parallel & Series
Control Valve(s)	Two Axial Piston
Drive Motors	Orbit Motor
Swing Motor	
Hydraulic Function Time	
Bucket	Curl 2.5 Sec. Dump 1.8 Sec.
Arm	Retract 4.7 Sec. Extend 3.3 Sec.
Extendable Arm	Retract 1.4 Sec. Extend 2.1 Sec.
Boom	Raise 3.7 Sec. Lower 4.8 Sec.
Boom Swing	Left 5.4 Sec. Right 6.0 Sec.
Blade	Raise 2.0 Sec. Lower 2.1 Sec.
SWING SYSTEM	
Swing Drive	Orbit Motor Connected to a Direct Drive
Swing Circle	Single Row Shear Type Ball Bearings with Internal Gear Built into Swing Circle
Swing Speed	9.3 RPM
HYDRAULIC CYLINDERS	
	Bore Dia. in. (mm) Rod Dia in. (mm) Stroke in. (mm)
Boom (cushion up)	3.25 (83) 1.75 (44) 25.31 (643)
Arm (cushion retract, extend)	3.00 (76) 1.75 (44) 23.62 (600)
Extendable Arm	2.25 (57) 1.50 (38) 33.00 (838)
Bucket	3.25 (83) 2.00 (51) 18.39 (467)
Boom swing (cushion left and right)	3.00 (76) 1.50 (38) 20.67 (525)
Blade	3.50 (89) 1.75 (44) 7.28 (185)
DRIVE SYSTEM	
Final Drive	Each Track is Driven by a Hydrostatic Axial Piston Motor
Type of Reduction	Two Stage Planetary Gear Reduction 36.4:1
Max. Drawbar Pull	7100 lbs. (3227 kg)
Gradability	30°
BRAKES	
Travel	
Service	Hydraulic Lock on Motor
Parking	Hydraulic Lock on Motor
Swing	
Service	Hydraulic Lock on Motor
Holding	Pin Lock
UNDERCARRIAGE	
Type	Crawler-Tractor Design Undercarriage. Sealed Track Rollers with Reinforced Box-Section Track Roller Frame. Grease Type Track Adjusters with Shock Absorbing Recoil Springs.
STD TRACK	
Type	Rubber
Width	12.6" (320 mm)
No. of Shoes	Single Assembly
No. of Track Rollers	4 each
Ground Pressure	4.52 PSI (31.2 kPa)
CAPACITIES	
Fuel Tank	14.4 gal. (54,5 L)
Radiator	4.0 gal. (15,1 L)
Engine Oil & Filter	7.5 qts. (7,1 L)
Hydraulic Reservoir	10.6 gal. (40 L)
DIGGING FORCE	
Arm Retracted	8600 lbf. (16013 N)
Arm Extended	2123 lbf. (9444 N)
Bucket	7000 lbf. (31136 N)

HYDRAULIC EXCAVATOR SPECIFICATIONS

334 (S/N 516711001 & Above)

Machine Dimensions

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



HYDRAULIC EXCAVATOR SPECIFICATIONS 334 (S/N 516711001 & Above) (Cont'd)**Lifting Capacity**



WARNING

OVERLOAD CAN TIP THE EXCAVATOR AND CAUSE INJURY OR DEATH

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

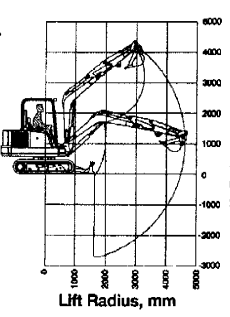


Where applicable, specifications conform to ISO Standards. Specifications are subject to change without notice. Lift Point is bucket hinge point with standard bucket attached and bucket cylinder fully extended.

EXCAVATOR MODEL 334 (AND MODELS 331 OR 331E EQUIPPED WITH LONG ARM)

BOOM LENGTH 2400 mm (94.5 in.)
ARM LENGTH 1500 mm (59.1 in.)
COUNTERWEIGHT 208.5 kg (459 lbs.)
X-CHANGE 24.9 kg (55 lbs.)
STANDARD BUCKET 609 mm (24.0 in.)
97.5 kg (215 lbs.)

CIRCUIT PRESSURES
WORKING 172 bar (2500 psi)
HOLDING 203 bar (2950 psi)



LIFT POINT HEIGHT	RATED LIFT CAPACITY OVER BLADE, BLADE DOWN - kg(lb.)				RATED LIFT CAPACITY OVER BLADE, BLADE UP - kg(lb.)				RATED LIFT CAPACITY OVER SIDE, BLADE UP - kg(lb.)			
	LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)				LIFT RADIUS - mm (in.)			
	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.	2000 (78.7)	3000 (118.1)	4000 (157.5)	MAX.
3000 (118.1)				329* (726)				319* (703)				350* (772)
2000 (78.7)		413* (911)	401* (884)	410* (903)		392* (864)	364* (802)	248 (548)		419* (923)	316 (696)	282 (578)
1000 (39.4)	1217* (2684)	623* (1373)	470* (1037)	435* (960)	1124* (2478)	502 (1108)	331 (730)	242 (534)	856 (1887)	486 (1072)	290 (640)	243 (536)
Ground	1385* (3054)	792* (1747)	573* (1263)	520* (1147)	796 (1756)	480 (1058)	300 (661)	286 (630)	711 (1568)	437 (965)	291 (643)	257 (566)
-1000 (-39.4)	1460* (3219)	887* (1958)		655* (1445)	737 (1626)	497 (1097)		321 (707)	782 (1681)	444 (979)		309 (680)

* Rated Hydraulic Lift Capacity

40421SW 99 6806616

WEIGHTS

Operating Weight (Includes
Standard Equipment and 20"
Bucket) – W/Rubber Tracks
W/Steel Tracks
W/Counterweights

Travel Speed

Lo
High

CONTROLS

Vehicle
Excavator Functions

ENGINE

Make
Model
Fuel
Horsepower
Maximum Governed RPM
(Full Load)
Torque
No. of Cylinders
Displacement
Bore x Stroke
Lubrication
Filter
Air Cleaner

ELECTRICAL

Alternator
Battery
Starter

334**WITH CANOPY**

7568 lbs. (3433 kg)
7726 lbs. (3505 kg)
Add 350 lbs. (159 kg)

WITH CAB

7828 lbs. (3551 kg)
7986 lbs. (3623 kg)
Add 350 lbs. (159 kg)

1.28 MPH (2,06 km/hr.)
3.45 MPH (5,55 km/hr.)

Two Hand or Foot Levers
Two hydraulic joysticks control boom, dipperstick,
bucket and cab swing. Two foot pedals control boom swing
and Aux. Hyd. The blade is controlled by a separate lever.

Kubota
V2203-E
Diesel
40 HP (29.9 Kw) @ 2400 RPM
2400 RPM
102.5 ft.-lbs. (139 Nm) @ 1600 RPM
Four
134 cu.-in. (2.1 L)
3.42" (87 mm) x 3.64" (92,4 mm)
Forced
Cartridge Type – Full Flow
Dry replaceable paper cartridge

12 Volt, 50 Amps.
12 Volt, 500 Cold Crank Amps. @ -18° C (0° F)
75 minute reserve capacity
12 Volt (2,7 kW) Reduction Drive

HYDRAULIC EXCAVATOR SPECIFICATIONS 334 (S/N 516711001 & Above) (Cont'd)

	334
HYDRAULIC SYSTEM	
Number of Pumps	Three
Type	Triple Section Gear Pump
Capacity	1 x 8.9 GPM (33,6 LPM) 2 x 7.6 GPM (28.8 LPM)
System Relief Setting	
Implement Circuits	2700 PSI (18617 kPa), 2800 PSI (19306 kPa), 2850 PSI (19651 kPa), 4100 PSI (28270 kPa), 3700 PSI (25512 kPa) 1700 PSI (11721 kPa) 16.5 GPM (62.4 L/min.) 5 Spool Parallel & Series Two Axial Piston Orbit Motor
Travel Circuits	
Swing Circuits	
Auxiliary Flow	
Control Valve(s)	
Drive Motors	
Swing Motor	
Hydraulic Function Time	
Bucket	Curl 2.5 Sec. Dump 1.8 Sec.
Arm	Retract 4.7 Sec. Extend 3.3 Sec.
Boom	Raise 3.7 Sec. Lower 4.8 Sec.
Boom Swing	Left 5.4 Sec. Right 6.0 Sec.
Blade	Raise 2.0 Sec. Lower 2.1 Sec.
SWING SYSTEM	
Swing Drive	Orbit Motor Connected to a Direct Drive
Swing Circle	Single Row Shear Type Ball Bearings with Internal Gear Built into Swing Circle 9.3 RPM
Swing Speed	
HYDRAULIC CYLINDERS	
	Bore Dia. in. (mm) Rod Dia in. (mm) Stroke in. (mm)
Boom (cushion up)	3.25 (83) 1.75 (44) 25.31 (643)
Arm (cushion retract, extend)	3.00 (76) 1.75 (44) 23.62 (600)
Bucket	3.25 (83) 2.00 (51) 18.39 (467)
Boom swing (cushion left and right)	3.00 (76) 1.50 (38) 20.67 (525)
Blade	3.50 (89) 1.75 (44) 7.28 (185)
DRIVE SYSTEM	
Final Drive	Each Track is Driven by a Hydrostatic Axial Piston Motor
Type of Reduction	Two Stage Planetary Gear Reduction 36.4:1
Max. Drawbar Pull	7100 lbs. (3227 kg)
Gradability	30°
BRAKES	
Travel	
Service	Hydraulic Lock on Motor
Parking	Hydraulic Lock on Motor
Swing	
Service	Hydraulic Lock on Motor
Holding	Pin Lock
UNDERCARRIAGE	
Type	Crawler-Tractor Design Undercarriage. Sealed Track Rollers with Reinforced Box-Section Track Roller Frame. Grease Type Track Adjusters with Shock Absorbing Recoil Springs.
STD TRACK	
Type	Rubber
Width	12.6" (320 mm)
No. of Shoes	Single Assembly
No. of Track Rollers	4 each
Ground Pressure	4.52 PSI (31.2 kPa)
CAPACITIES	
Fuel Tank	14.4 gal. (54,5 L)
Radiator	4.0 gal. (15,1 L)
Engine Oil & Filter	7.5 qts. (7,1 L)
Hydraulic Reservoir	10.6 gal. (40 L)
DIGGING FORCE	
Arm	2880 lbf. (12810 N)
Bucket	7000 lbf. (31136 N)

FUEL, COOLANT AND LUBRICANTS

Chart

Use this chart for correct selection of Fuel, Coolant and Lubricants.

RESERVOIR	KIND OF FLUID	RECOMMENDED SAE VISCOSITY NUMBER (LUBRICATION OILS FOR ENGINE CRANKCASE) C° -34 -29 -23 -18 -13 -7 -1 +4 +10 +15 +21 +27 +32 +38 +43 +49 +54 +60 F° -30 -20 -10 0 +10 +20 +30 +40 +50 +60 +70 +80 +90 +100 +110 +120 +130 +140	CAPACITY
			Refill
Engine oil pan	Use SAE Viscosity Number as Listed With API Classification CD or Better		7.5 qts. (7,1 L)
Fuel Tank	Diesel Fuel		14.40 gal. (54,5 L)
Cooling System	Coolant Mixture**		4.0 gal. (15 L)
Hydraulic Tank	Bobcat Fluid 6563328*		Tank Cap. 10.5 Gals. (40,0 L) System Cap. 17.6 Gals. (66,6 L)
Travel Motors (each side)	90W Gear		1.06 qts. (1,0 L)

* If Bobcat fluid (P/N 6563328) is not available, use Engine Oil SAE 10W-30/10W-40, Class SE, or better.

■ Can be used ONLY when available with appropriate diesel rating.

ENGINE OIL SPECIFICATIONS

Description

When fuel sulphur content is less than 0.5% change the engine oil and filter as shown in the Service Schedule Page 35.

Change engine oil and filter according to the following chart if fuel sulphur content is above 0.5%.

Fuel Sulphur Content	Change Interval Of Engine Oil & Filter
0.5 to 1.0%	1/2 of Regular Interval
Above 1.0%	1/4 of Regular Interval

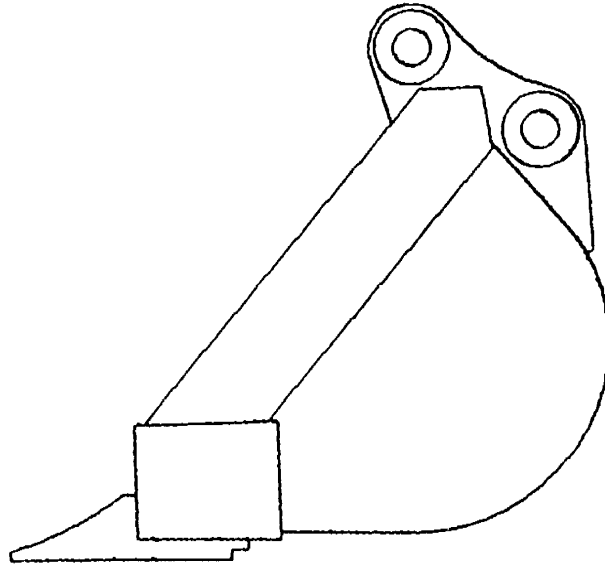
** COOLANT MIXTURE

Propylene Glycol (Factory Installed)

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

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

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



Bucket Size

Capacity SAE Heaped

Shipped Weight

12 in. (305 mm)
 16 in. (406 mm)
 20 in. (509 mm)
 24 in. (609 mm)
 30 in. (762 mm)

1.59 cu. ft. (0,043 cu. m.)
 2.12 cu. ft. (0,060 cu. m.)
 2.81 cu. ft. (0,080 cu. m.)
 3.62 cu. ft. (0,103 cu. m.)
 4.60 cu. ft. (0,130 cu. m.)

126.6 lbs. (57,5 kg)
 144.0 lbs. (65,4 kg)
 160.0 lbs. (73,0 kg)
 175.6 lbs. (79,7 kg)
 215.9 lbs. (98,0 kg)

X-Change Bucket Size

Capacity SAE Heaped

Shipped Weight

13 in. (330 mm)
 16 in. (406 mm)
 20 in. (509 mm)
 24 in. (609 mm)
 30 in. (762 mm)
 36 in. (914 mm)
 39 in. (990 mm)

1.48 cu. ft. (0,042 cu. m.)
 1.98 cu. ft. (0,056 cu. m.)
 2.68 cu. ft. (0,076 cu. m.)
 3.37 cu. ft. (0,095 cu. m.)
 4.43 cu. ft. (0,125 cu. m.)
 5.45 cu. ft. (0,154 cu. m.)
 5.15 cu. ft. (0,146 cu. m.)

149 lbs. (68 kg)
 169 lbs. (77 kg)
 196 lbs. (90 kg)
 221 lbs. (100 kg)
 248 lbs. (113 kg)
 282 lbs. (282 kg)
 276 lbs. (125 kg)

BOBCAT APPROVED ATTACHMENTS & ACCESSORIES

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.

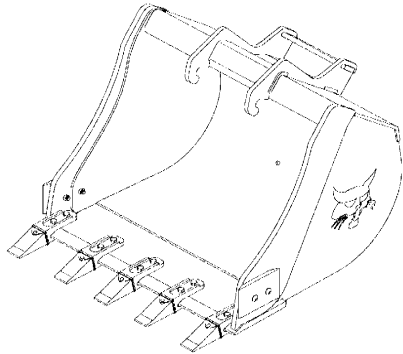
The versatile Bobcat excavator quickly turns into a multi-job machine with a variety of attachments.

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

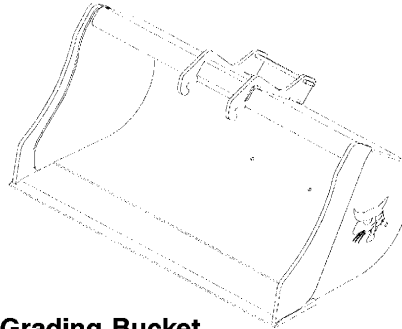
Increase the versatility of your Bobcat Excavator with a variety of bucket sizes.

BUCKETS AVAILABLE

Many different bucket widths/capacities are available for a variety of applications. See your Bobcat dealer for the correct bucket for your application.



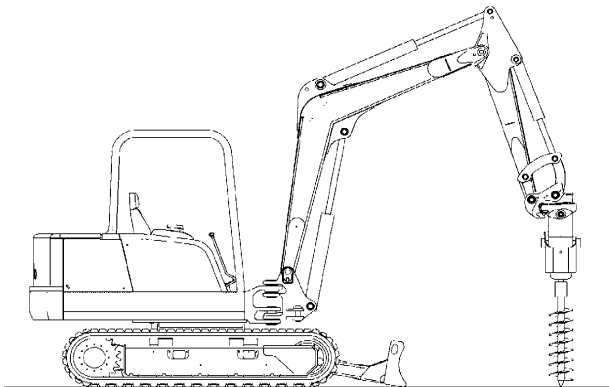
Trenching Bucket



Grading Bucket

ATTACHMENTS

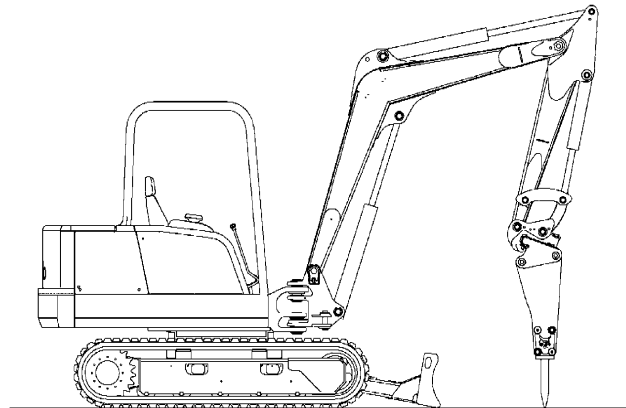
Auger



TS-01942

Dig 6" – 36" holes with ease and accuracy.

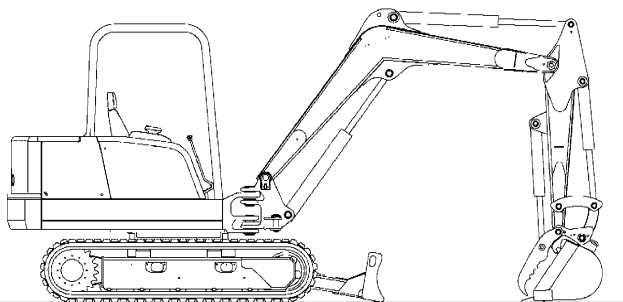
Breaker



TS-01943

Break up concrete quickly and easily.

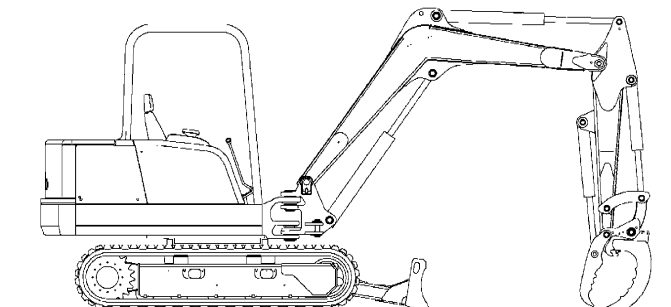
Hydraulic Clamp



TS-01944

Use with a bucket to pick up debris. Requires the use of port relief valves in the auxiliary valve circuit.

3 – Tined Grapple



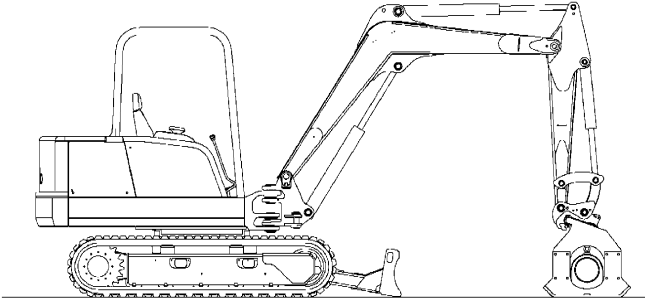
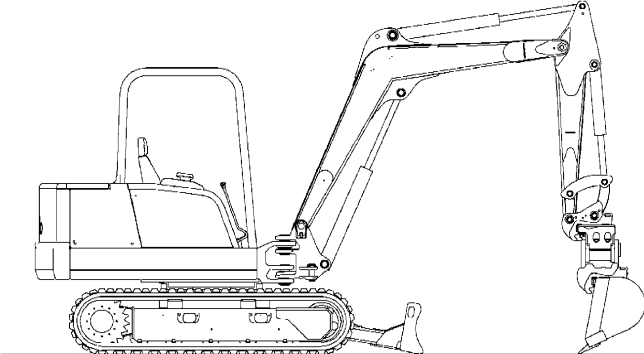
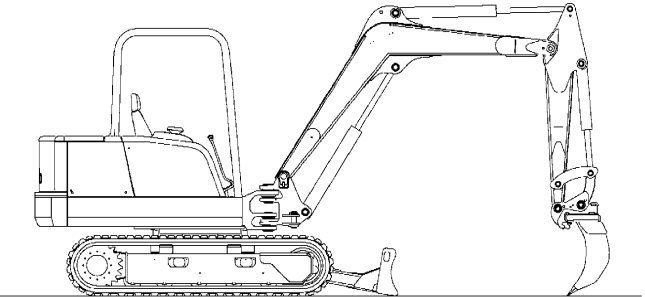
TS-01946

Must be used with X-Change™ system. Use with the hydraulic clamp to pick up debris, rocks, etc.

BOBCAT APPROVED ATTACHMENTS & ACCESSORIES (Cont'd)

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.

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

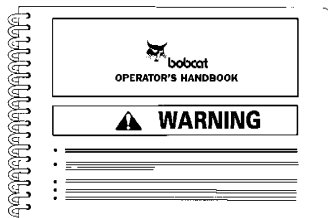
ATTACHMENTS (Cont'd)	
Compactor  TS-01945 Must be used with the X-Change™ system. Use for compacting soil after the excavating job is finished.	Power-Tilt  TS-01947 Must be used with the X-Change™ system. Used for rotating the bucket to cut at angles and for finishing work.
Ripper  TS-01948 Must be used with the X-Change™ system. Used for penetrating and to scarify frost or hard ground.	



ADDITIONAL PUBLICATIONS and TRAINING MATERIALS

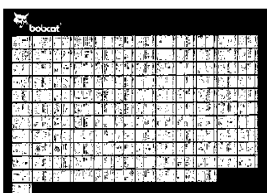
The following publications and training materials are also available for your Bobcat Compact Excavator. You can order them from your Bobcat dealer.

For the latest information on Bobcat products and Bobcat, visit our website at www.bobcat.com



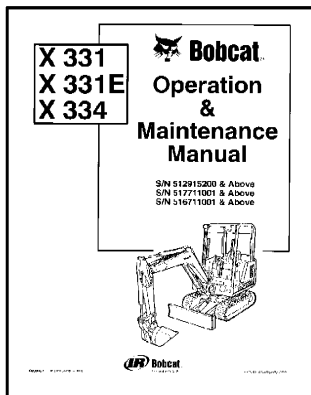
**OPERATOR'S
HANDBOOK**
6900465

—gives basic operation instruction and safety warnings.



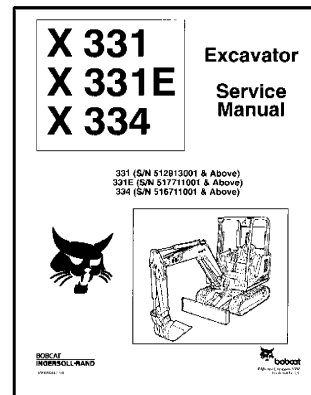
**PARTS
MICROFICHE**

—Up-to-date PARTS information is also available. See your BOBCAT dealer.



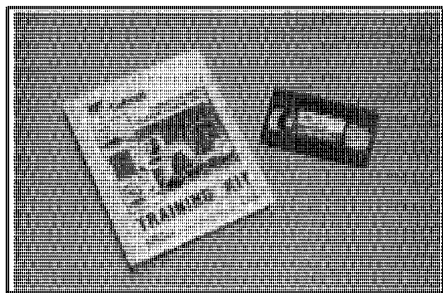
**OPERATION & MAINTENANCE
MANUAL**
6900557

—complete instruction on the correct operation and the routine maintenance of the BOBCAT Compact Excavator.



SERVICE MANUAL
6900464

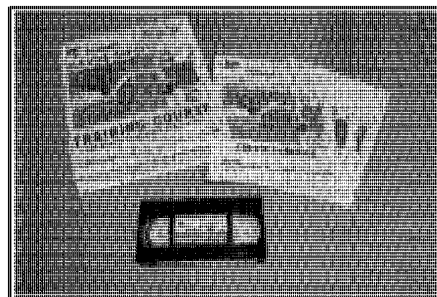
—complete maintenance and overhaul instructions for your BOBCAT Compact Excavator.



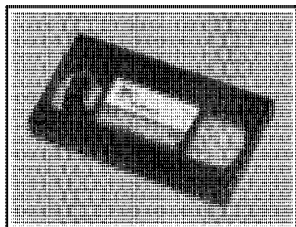
**COMPACT EXCAVATOR
OPERATOR
TRAINING COURSE**
6722950

—Introduces operator to step-by-step basics of Compact excavator operation. Also available in Spanish P/N 6900125.

**COMPACT EXCAVATOR
SERVICE SAFETY
TRAINING COURSE**
6900916



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



**OPERATION
SAFETY
VIDEO**
6724750

—provides basic safety instructions.

**SAFETY
MANUAL**
6570354



—provides basic safety procedures and warnings for your BOBCAT Compact Excavator.

WARRANTY

Bobcat Excavators

Bobcat Company warrants to its authorized dealers and authorized dealers of Bobcat Equipment Ltd., who in turn, warrant to the original buyer (owner), that each new Bobcat excavator will be free from proven defects in material and workmanship for twelve months after delivery to the original buyer (owner).

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

The warranty does not cover replacement of scheduled service items such as oil, filters, tune-up parts, and other high-wear items. The warranty does not cover damages resulting from abuse, accidents, alterations, use of the Bobcat product with any bucket or attachment not approved by Bobcat Company, air flow obstructions, or failure to maintain or use the Bobcat product according to the instructions applicable to it.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES (EXCEPT THOSE OF TITLE), EXPRESSED OR IMPLIED, AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL BOBCAT COMPANY OR THE AUTHORIZED BOBCAT DEALER BE LIABLE FOR DOWNTIME EXPENSES, LOSS OF MACHINE USE OR OTHER INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.



