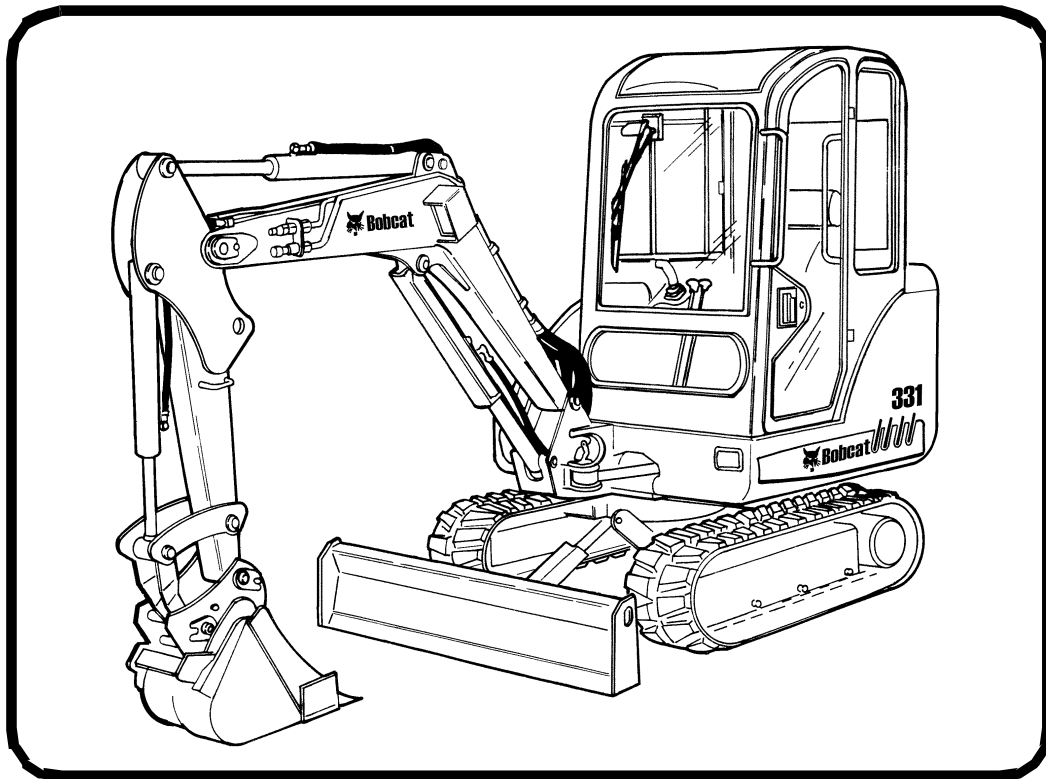




Bobcat®

Operation & Maintenance Manual 331 / 331E / 334 Compact Excavator

331 - S/N 234311001 & Above
331E - S/N 234411001 & Above
334 - S/N 234511001 & Above



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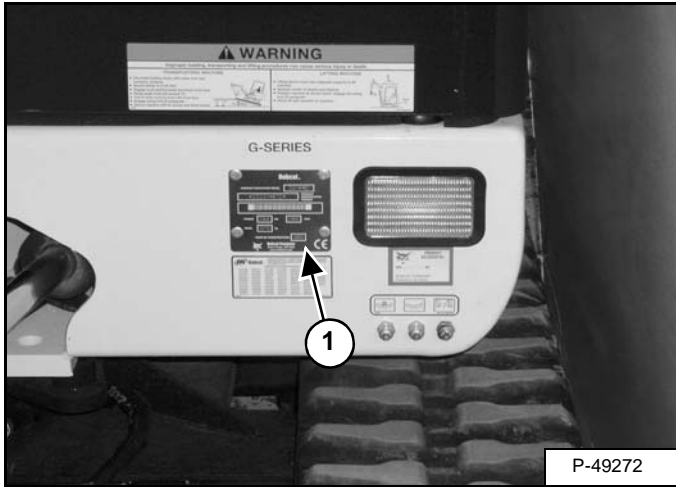
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SERIAL NUMBER LOCATIONS

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

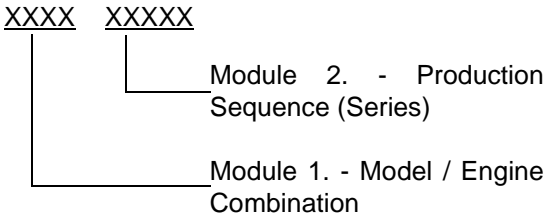
Excavator Serial Number

Figure 1



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

Explanation of Excavator Serial Number:

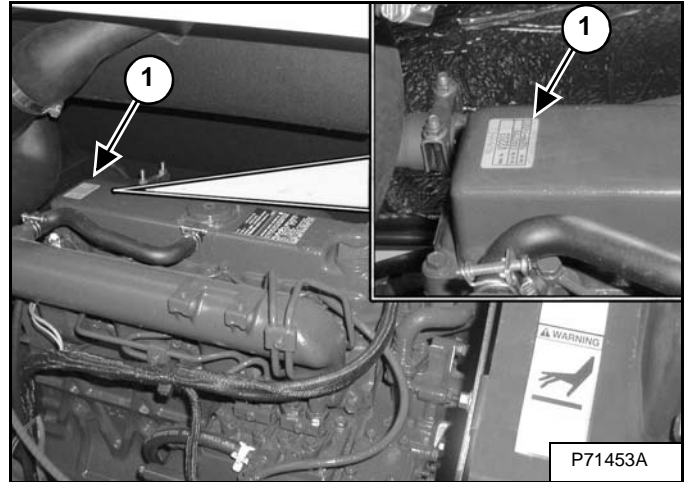


1. The four digit Model/Engine Combination Module number identifies the model number and engine combination.

2. The five digit Production Sequence Number identifies the order which the excavator is produced.

Engine Serial Number

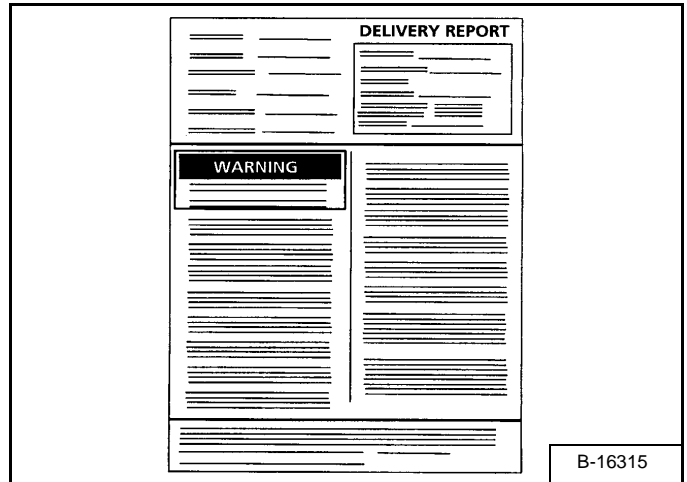
Figure 2



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

DELIVERY REPORT

Figure 3



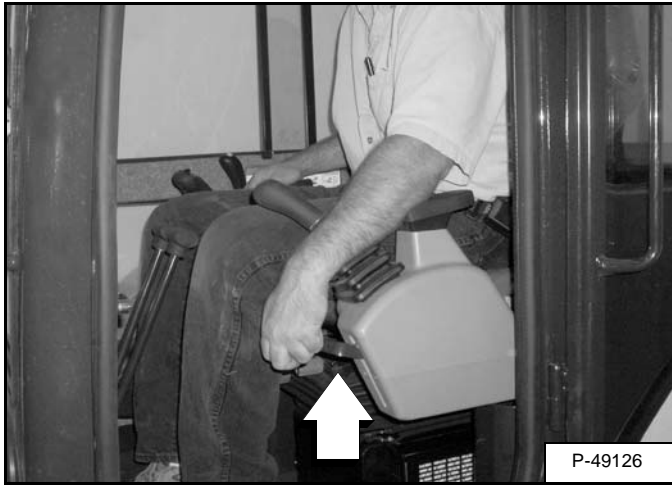
The delivery report must be filled out by the dealer and signed by the owner or operator when the Bobcat Excavator is delivered. An explanation of the form must be given to the owner. Make sure it is filled out completely [Figure 3].

INSTRUMENTS AND CONTROLS (CONT'D)

Raising And Lowering The Console

Raise the console before exiting the cab.

Figure OI-8



Pull up on the release handle [Figure OI-8]. The lift spring will assist in raising the console.

Lower the console before operating the excavator.

Push down on the console [Figure OI-8] until the latch is engaged.

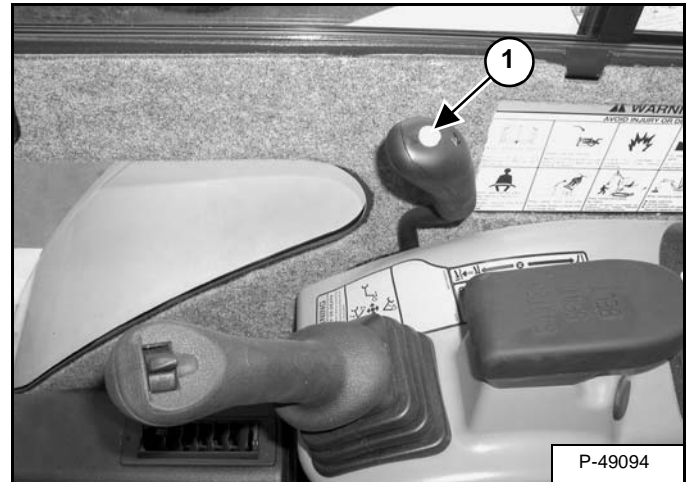
NOTE: When the console is raised, the hydraulic and traction system functions are locked and will not operate.

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

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

Two-Speed Travel

Figure OI-9



Press the button (Item 1) [Figure OI-9] to engage the High Range. Press a second time to disengage.

Figure OI-10



When High Range is engaged, the two speed travel icon (Item 1) [Figure OI-10] will illuminate.

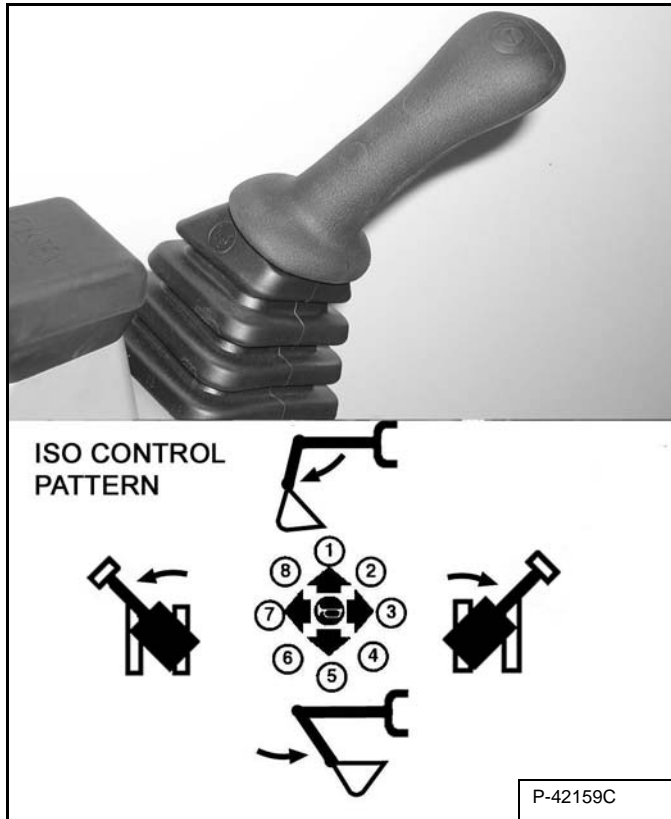
Press the button (Item 1) [Figure OI-9] again to disengage.

HYDRAULIC CONTROLS (CONT'D)

ISO Control Pattern

Left Control Lever (Joystick)

Figure OI-37



The left lever (joystick) is used to operate the arm and slew the upperstructure [Figure OI-35].

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

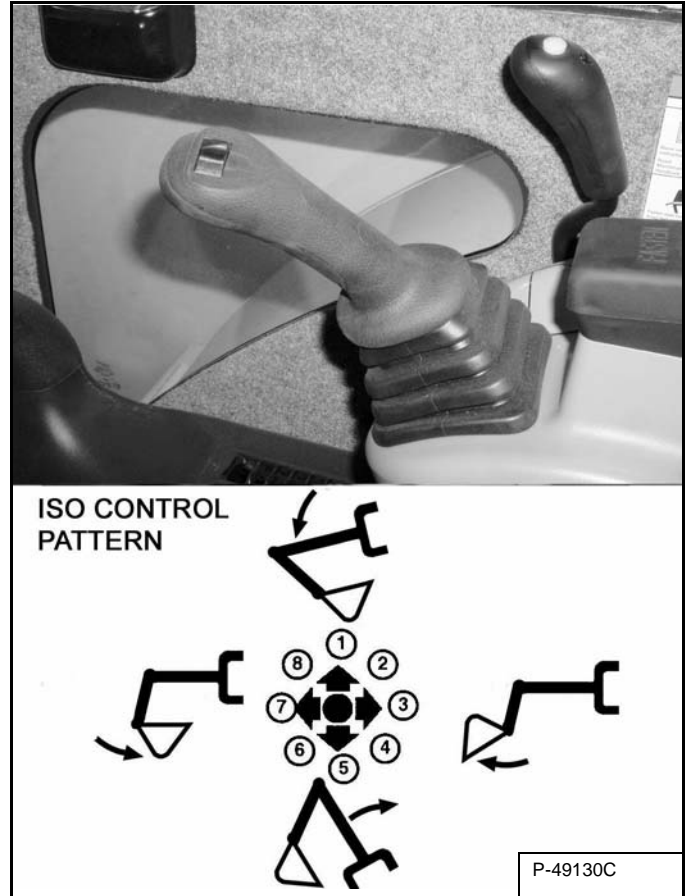
IMPORTANT

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

I-2051-0905

Right Control Lever (Joystick)

Figure OI-38



The right lever (joystick) is used to operate the boom and bucket [Figure OI-36].

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

STARTING THE ENGINE (CONT'D)

Cold Temperature Starting

! WARNING

AVOID INJURY OR DEATH

Do not use ether with glow plug (preheat) systems. Explosion can result which can cause injury, death, or severe engine damage.

W-2071-0907

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

- Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See ENGINE LUBRICATION SYSTEM on Page PM-17.)
- Make sure the battery is fully charged.
- Install an engine heater.

NOTE: If the battery is discharged (but not frozen) a booster battery can be used to jump start the excavator. (See Using A Booster Battery (Jump Starting) on Page PM-24.)

Figure OI-59



Push the speed control lever (Item 1) [Figure OI-59] fully forward.

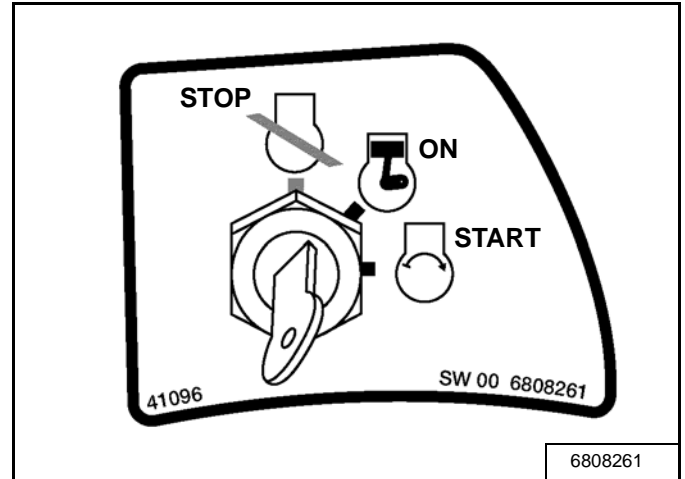
IMPORTANT

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

I-2034-0700

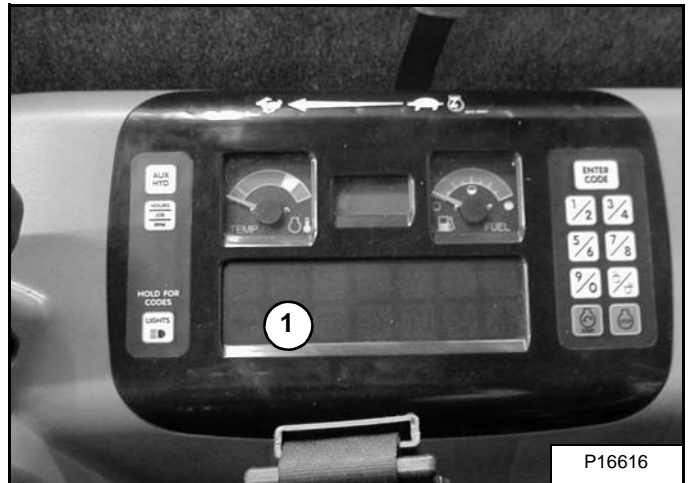
Key Switch

Figure OI-60



Turn the key to the ON position [Figure OI-60].

Figure OI-61



The preheat icon (Item 1) [Figure OI-61] will come ON. The glow plugs will automatically cycle. When the icon goes off, turn the key to start.

Release the key when the engine starts, it will return to the ON position.

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

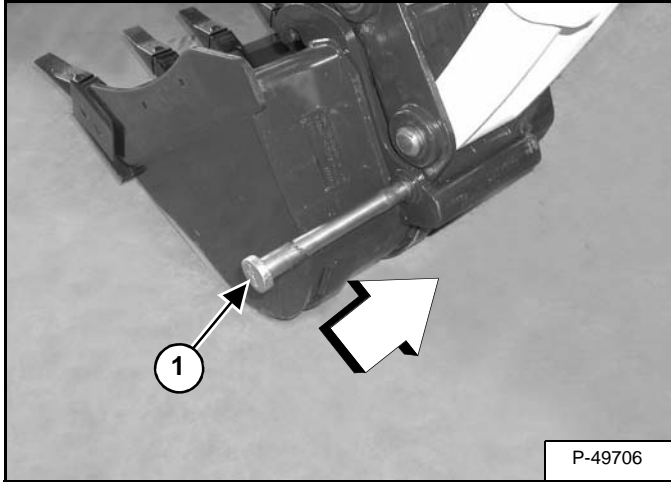
When the engine speed increases, move the speed control lever to idle position until the engine warms.

ATTACHMENTS (CONT'D)

Installing And Removing The Attachment (Pin-On X-Change) (Cont'd)

Installation (Cont'd)

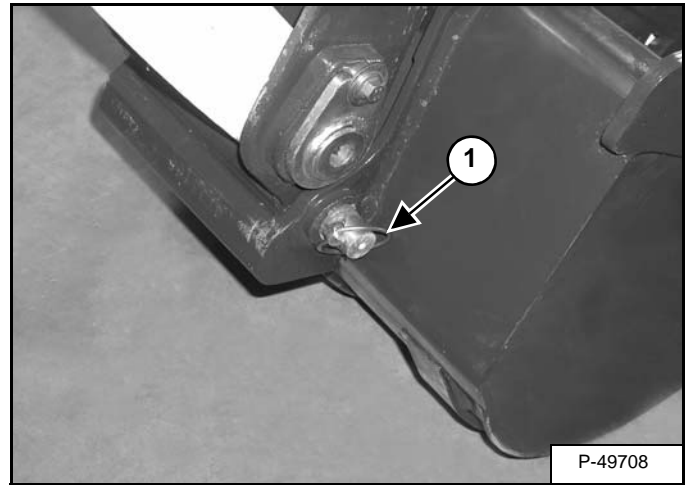
Figure OI-87



Stop the engine. Turn the start key to the ON position and move both hydraulic control levers to relieve hydraulic pressure.

Drive the pin (Item 1) **[Figure OI-87]** through the bucket mount and X-Change.

Figure OI-88



Install the retainer pin (Item 1) **[Figure OI-88]**.

Check for proper installation.

Lift the attachment and fully extend and retract the bucket cylinder.

ATTACHMENTS (CONT'D)

Installing And Removing The Attachment (Latching X-Change System)

Installation

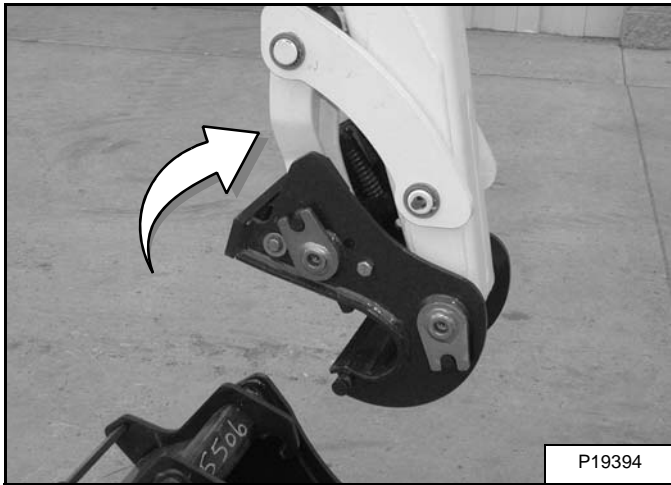
! WARNING

AVOID INJURY OR DEATH

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

W-2052-0907

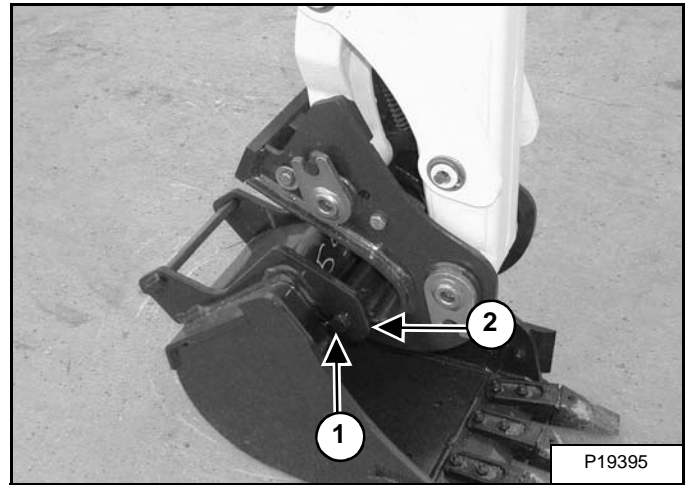
Figure OI-107



Fully retract the bucket cylinder to release the latch on the X-Change [Figure OI-107].

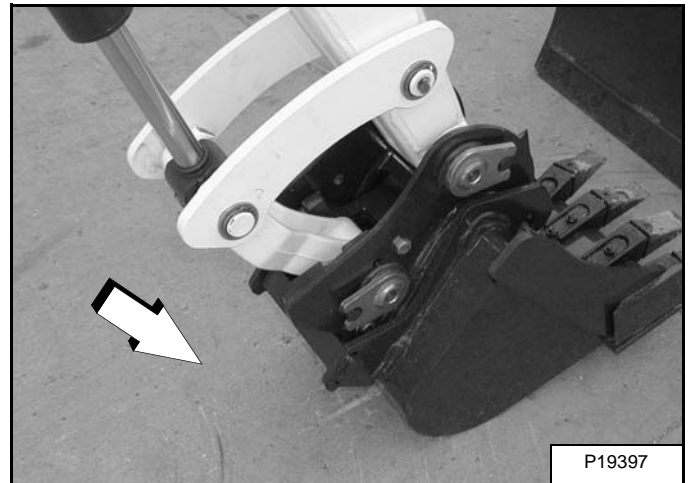
Move the arm toward the bucket.

Figure OI-108



Raise the boom until the pins (Item 1) engage the hooks (Item 2) [Figure OI-108] on the bucket.

Figure OI-109



Lift the boom and extend the bucket cylinder until the bucket is in the position shown [Figure OI-109].

OPERATING PROCEDURE (CONT'D)

Operating On Slopes

! WARNING

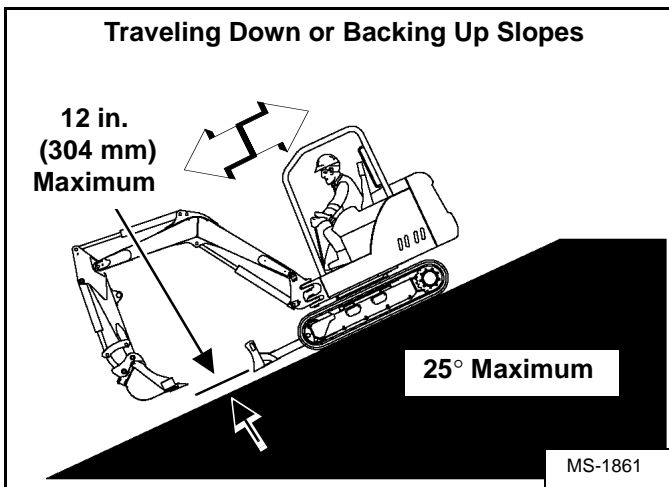
AVOID INJURY OR DEATH

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

W-2497-0304

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

Figure OI-131



When going down grades that exceed 15 degrees, put the machine in the position shown, and run the engine slowly [Figure OI-131].

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.

! WARNING

AVOID INJURY OR DEATH

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

W-2498-0304

Figure OI-132

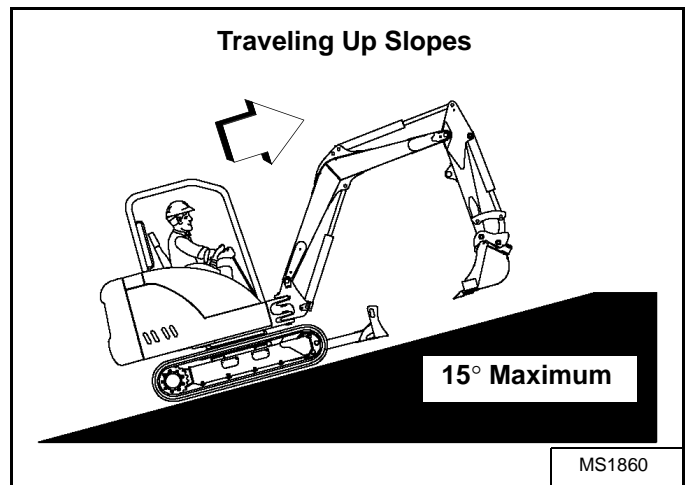
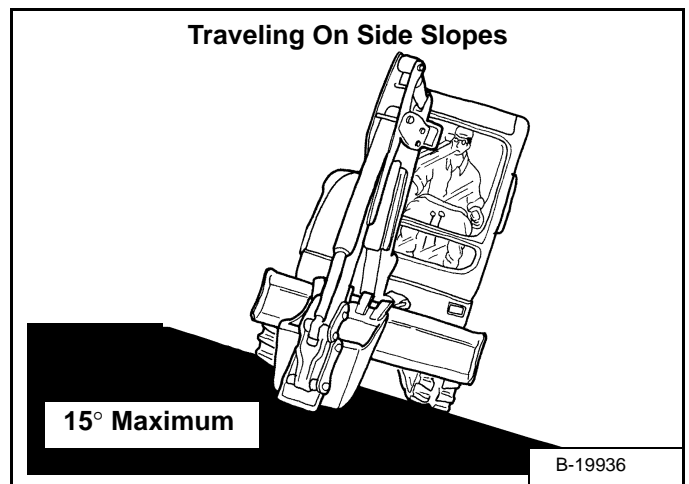


Figure OI-133



When traveling up slopes or on side slopes that are 15 degrees or less, position the machine as shown and run the engine slow [Figure OI-132] & [Figure OI-133].

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SERVICE SCHEDULE

Chart

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

 <b style="font-size: 24pt; margin-left: 10px;">WARNING	<p>Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.</p> <p style="text-align: right; font-size: 10pt;">W-2003-0903</p>
--	--

SERVICE SCHEDULE		HOURS					
ITEM	SERVICE REQUIRED	8-10	50	100	250	500	■ 1000
Engine Coolant	Check coolant level. Add premixed coolant as needed.						
Engine Oil	Check the engine oil level and add as needed.						
Hydraulic Fluid, Hoses and Tubelines, Reservoir Breather Cap	Check the hydraulic fluid level and add as needed. Check for damage and leaks. Repair or replace as needed.						
Engine Air Filter and Air System	Check condition indicator and empty dust cup as needed. Check air system for leaks.						
Tracks	Check and adjust track tension as needed.						
Indicators and Lights	Check for correct operation of all indicators and lights.						
Operator Canopy/Cab	Check condition. Check mounting hardware.						
Seat Belt	Check condition. Check mounting hardware.						
Safety Signs and Safety Treads	Check for damaged signs (decals) and safety treads. Replace any signs or safety treads that are damaged or worn.						
Pivot Points	Grease all machinery pivot points.						
Cab Heater Air Filter	Clean the filter as needed.						
Console Lockout	Check console lockout for proper operation.						
X-Change	Lubricate and inspect for damage or loose parts.						
Swing Circle and Pinion	Grease two fittings						
Fuel Tank & Filter	Drain water and sediment from fuel tank and fuel filter.						
Battery	Check battery, cables, connections and electrolyte level. Add distilled water as needed.						
Accessory Drive Belt	Check condition of belt and adjust as needed.		●				
Spark Arrestor Muffler	Clean the spark chamber.						
Fuel Filter	Replace fuel filter.						
Engine Oil and Filter	Replace oil and filter use CD or better grade oil and Bobcat filter.		▼				
Radiator, Oil Cooler, *A/C	Clean debris from the radiator fins.						
Primary Hydraulic Filter	Replace the primary hydraulic filter.			^			
Case Drain Filter	Replace the case drain filter.			^			
Alternator & Starter	Check the alternator and starter connections.						
Engine Valves	Check and adjust the engine valve clearance.						
Engine Cooling System	Drain and flush the cooling system. Replace the coolant.						
Hydraulic System	Replace the hydraulic fluid and filters. Clean the reservoir.						
Travel Motor	Replace the lubricant in both travel motors.			t			

*** If Equipped**

- Check after the first 50 hours, then 100 hour intervals thereafter.
- ▼ First oil and filter change must occur at 50 hours; then 500 hour intervals thereafter.
- ^ Check after the first 100 hours, then 500 hour intervals thereafter.
- t Check after the first 100 hours, then 1000 hour intervals thereafter.
- Or every 6 months.

FUEL SYSTEM

Fuel Specifications

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

The following is a suggested blending guideline which should prevent fuel gelling problems during freezing temperature

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

See your fuel supplier for local recommendations.



AVOID INJURY OR DEATH

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

W-2063-0807



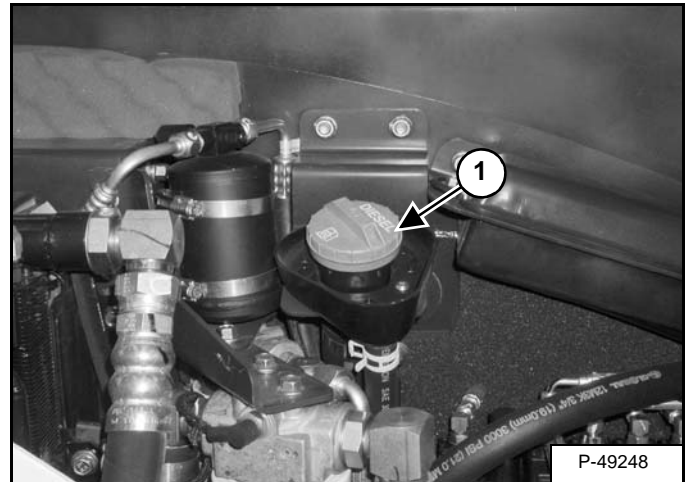
AVOID INJURY OR DEATH

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

W-2103-0807

Filling The Fuel Tank

Figure PM-22



Open the right side cover and remove the fuel fill cap (Item 1) [Figure PM-22].

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

Install and tighten the fuel fill cap.

Clean up any spilled fuel.

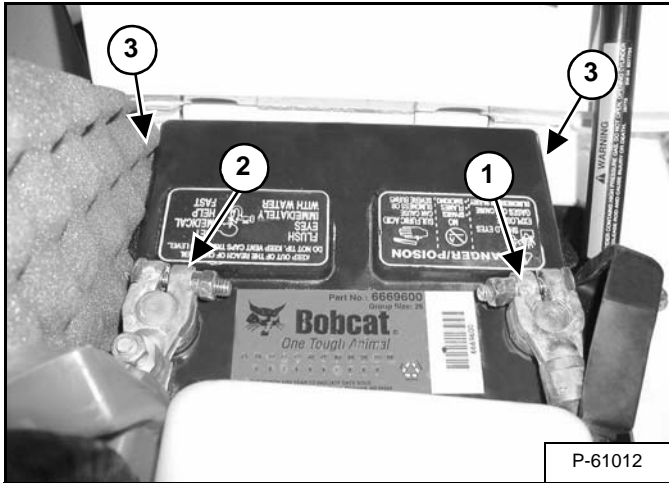
See the SERVICE SCHEDULE for the service interval when to remove water from or replace the fuel filter. (See SERVICE SCHEDULE on Page PM-5.)

ELECTRICAL SYSTEM (CONT'D)

Removing And Installing The Battery

Open the right side cover.

Figure PM-42



Disconnect the negative (-) cable (Item 1) [Figure PM-42] first.

Disconnect the positive (+) cable (Item 2) [Figure PM-42].

Remove the bolts (Item 3) [Figure PM-42] and remove the hold down clamp.

Remove the battery.

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

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

Connect the battery cables. Connect the negative (-) cable (Item 1) [Figure PM-42] last to prevent sparks.

WARNING

AVOID INJURY OR DEATH

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

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

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

W-2065-0807

BUCKET

Bucket Teeth Removal And Installation

WARNING

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

- Pressurized fluids and springs or other stored energy components.
- Flying debris or loose material is present.
- Engine is running.
- Tools are being used.

W-2505-0604

Position the bucket so the bucket teeth are at a 30° angle up from the ground for accessibility to the teeth.

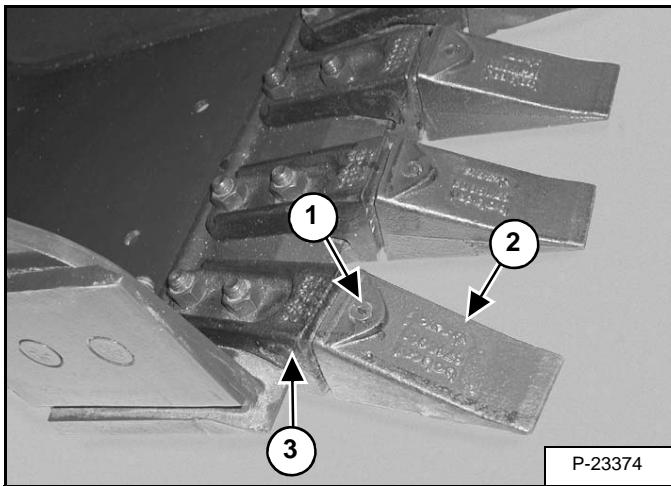
Lower the boom until the bucket is fully on the ground.

Stop the engine and exit the excavator.

NOTE: The later style tooth points and retaining pins can be used on the early style shanks.

Early Style Bucket Teeth

Figure PM-61

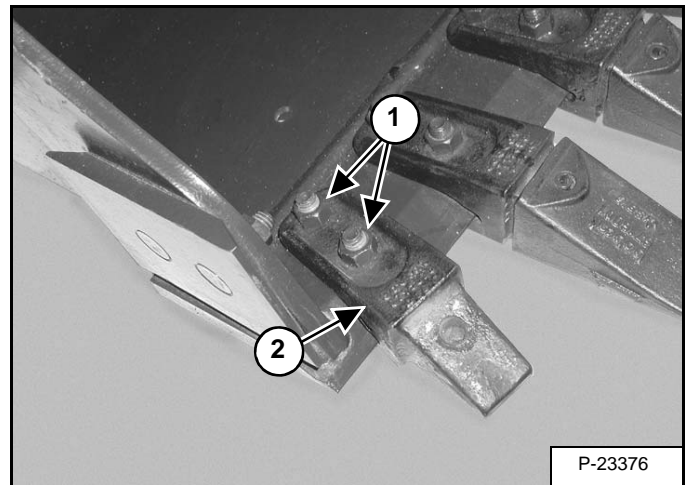


Remove the retaining pin (Item 1) from the tooth point (Item 2) [Figure PM-61].

Remove the tooth point (Item 2) from the shank (Item 3) [Figure PM-61].

Installation: Position the new tooth point on the shank and install a new retaining pin. Install the retaining pin until it is flush with the top of the point.

Figure PM-62

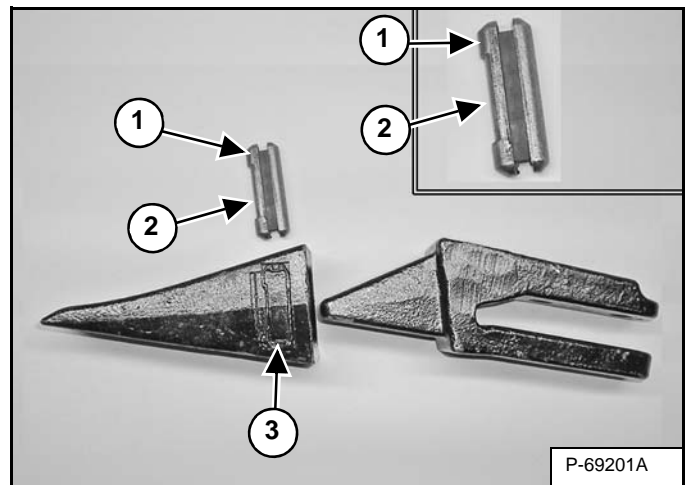


Remove the two nuts (Item 1) and bolts from the tooth shank (Item 2) [Figure PM-62]. Remove the tooth shank.

Installation: Tighten the nuts to 90 - 100 ft. - lb. (125 - 135 N•m) torque.

Later Style Bucket Teeth

Figure PM-63



The removal and installation procedure for the later style tooth point and tooth shank is the same as the early style.

The later style tooth has a unique retaining pin (Item 1). The retaining pin must be installed as shown [notch (Item 2) to the front] for proper fit and tooth retention. The side of the tooth point (Item 3) [Figure PM-63] also shows the correct orientation of the retaining pin.

Installation: Position the new tooth point on the shank and install a new retaining pin. Install the retaining pin until it is flush with the top of the point.

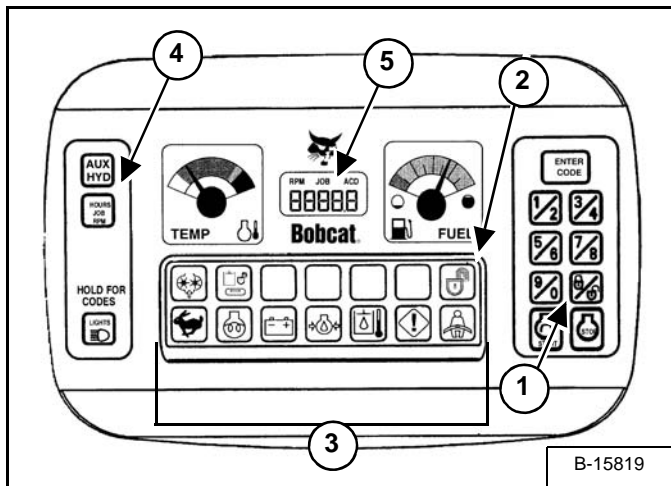
DELUXE INSTRUMENT PANEL SETUP (CONT'D)

Password Lockout Feature

This allows the operator to Unlock the password feature so that a password does not need to be used every time you start the engine.

Perform Password Entry (See "Password Entry (For Starting and Operating the Machine)" on Page SA-4.) (the engine can be started or stopped.) The password entry can be performed with the engine off or with the engine running.

Figure SA-2



Press the Lock/Unlock button (Item 1) [Figure SA-2]. The LCD will continuously alternate from **UnLoc** to **Code** for 1 second periods.

Perform Password Entry again.

UnLoc will appear in the LCD (Item 5), the Unlocked Icon (Item 2) will appear in the Icon Display Area (Item 3) [Figure SA-2] and there will be two short beeps.

To start an Unlocked system, press the ENTER CODE button and press the START button.

When you stop the engine with the system unlocked, you will hear one long beep every 3 seconds for 15 seconds.

To lock the system again, press the Lock/Unlock button (Item 1) [Figure SA-2] and enter the password during the 15 second period.

Job Clock

The JOB CLOCK can be set to record accumulated hours for a particular job.

Press and release the HOURS/JOB/RPM button (Item 4) until JOB light is ON at the top, center of the LCD (Item 5) [Figure SA-2].

While the JOB light is ON, press and hold the HOURS/JOB/RPM button (Item 4) [Figure SA-2] until the LCD returns to zero.

This process will clear the accumulated hours and will begin recording JOB CLOCK time again. (This does not affect the HOURMETER which continues to record the total operating hours of the excavator.)

Pressing the HOURS/JOB/RPM button again or pressing the START button will return the LCD to HOURMETER function.

RPM

The LCD (Item 5) [Figure SA-2] can be set to display engine RPM.

With the engine running, press and release the HOURS/JOB/RPM button (Item 4) until RPM light is ON at the top, center of the LCD (Item 5) [Figure SA-2].

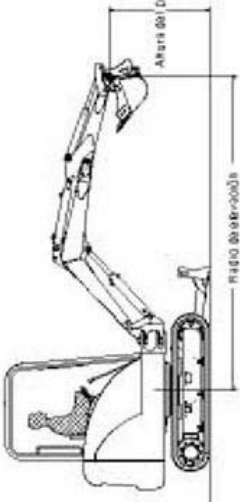
Engine RPM is now displayed in the LCD.

Press the HOURS/JOB/RPM button (Item 4) [Figure SA-2] again the return to HOURMETER function.

EXCAVADORA MODELO 331

PRESIONES DEL CIRCUITO EN FUNCIONAMIENTO
240 bar (3480 psi)
270 bar (3915 psi)

LONGITUD DE LA PLUMA 2400 mm (94.5 pulg.)
LONGITUD DEL BRAZO 1200 mm (47.2 pulg.)
CONTRAPESO 235 (517 lb)
CUCHARÓN ESTÁNDAR 609 mm (24.0 pulg.)
97.5 kg (215 lb)



ADVERTENCIA

LA SOBRECARGA PUEDE PROVOCAR EL VUELCO DE LA EXCAVADORA, CON EL CONSIGUIENTE RIESGO DE LESIONES O ACCIDENTES MORTALES

- No levante ni retenga ninguna carga que exceda estas capacidades nominales a sus radios y altura especificados.
- Se muestra la capacidad nominal de carga total. Para determinar la carga neta que puede levantarse, se debe restar el peso de todos los dispositivos de elevación.

Donde proceda, las especificaciones cumplen con las normas ISO y están sujetas a sufrir cambios sin previo aviso.
El punto de elevación es el punto de la articulación del cucharón con el cucharón estándar colocado y el cilindro del cucharón totalmente extendido.

ALTURA DEL PUNTO DE ELEVACIÓN	CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA HOJA, CON LA HOJA HACIA ABAJO - kg (lb)			CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE LA HOJA, CON LA HOJA HACIA ARRIBA - kg (lb)			CAPACIDAD NOMINAL DE ELEVACIÓN SOBRE UN LADO, CON LA HOJA HACIA ARRIBA - kg (lb)		
	RADIO DE ELEVACIÓN - mm (pulg.)			RADIO DE ELEVACIÓN - mm (pulg.)			RADIO DE ELEVACIÓN - mm (pulg.)		
3000 (118.1)	*493 (1086) a	*560 (1235) a	*601 (1325)	*469 (1034) a	*564 (1242)	*596 (1314)	*487 (1073) a	3815 (150)	3815 (150)
2000 (78.7)	*562 (1238)	*631 (1392) a	*894 (1971)	3815 (150)	4270 (168)	4270 (168)	353 (778) a	419 (925)	4270 (168)
1000 (39.4)	*666 (1468)	4310 (170)	*1095 (2414)	371 (818) a	410 (904)	627 (1382)	315 (695) a	391 (861)	4310 (170)
Suelo	*746 (1644)	*725 (1599) a	*1129 (2488)	370 (816) a	388 (855)	588 (1296)	338 (745) a	373 (821)	4067 (160)
-1000 (-39.4)	*1129 (2488)	*831 (1833) a		4067 (160)	622 (1370)	1112 (2453)	413 (910) a	583 (1285)	3576 (141)
		3576 (141)		450 (992) a	1073 (2365)				

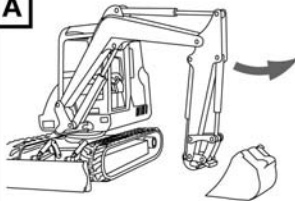
* Capacidad nominal de elevación hidráulica

61322 SW 04 7110140

HYDRAULIC X-CHANGE® SYSTEM

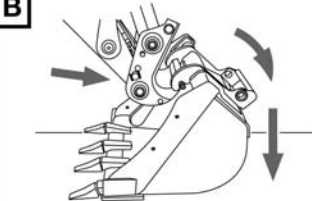
TO INSTALL THE ATTACHMENT

A



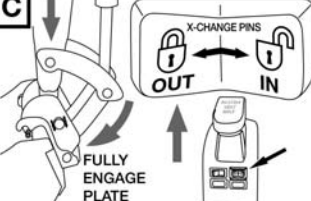
1. Start the engine. Swing excavator arm fully to the left.
2. Press and hold the X-Change switch on left console to the right to fully retract the hydraulic pins.

B



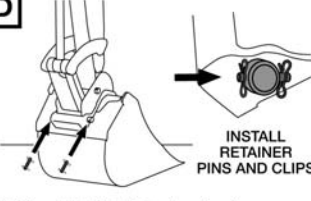
3. Move the arm toward the attachment and raise the boom until the X-Change pins engage the attachment hooks.
4. Raise the boom and extend (curl in) the bucket cylinder until the X-Change contacts the back of the attachment.

C



5. With the arm vertical, lower the boom until the attachment hooks disengage the X-Change pins, and plate fully engages into the attachment crossmember.
6. Press and hold the X-Change switch to the left and FULLY EXTEND the hydraulic pins.

D

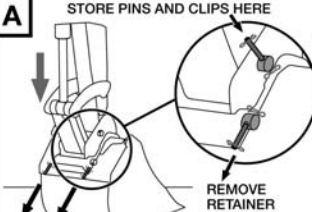


7. Check that both hydraulic pins are fully engaged to secure attachment.
8. STOP THE ENGINE. INSTALL BOTH RETAINER PINS AND CLIPS INTO EACH HYDRAULIC PIN.

NEVER OPERATE WITH RETAINER PINS AND CLIPS NOT INSTALLED. ONLY USE APPROVED RETAINER PINS AND CLIPS.

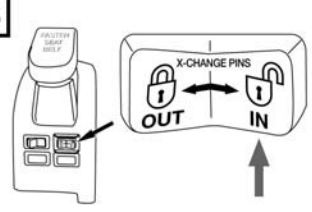
TO REMOVE THE ATTACHMENT

A



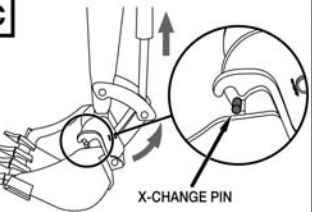
1. Lower attachment to the ground. Stop the engine.
2. Remove both retainer pins and clips from both hydraulic pins and place them in the storage location.
3. INSTALL RETAINER PINS AND CLIPS IN STORAGE LOCATION ON X-CHANGE.

B



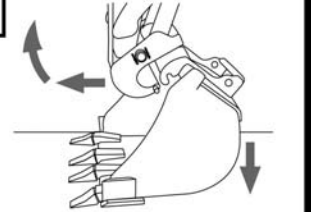
4. Start the engine. Press and hold the X-Change switch on left console to the right to FULLY RETRACT the hydraulic pins.

C



5. Raise the boom and retract the bucket cylinder until the X-Change pins engage the attachment hooks.

D



6. Fully retract (bucket dump) the bucket cylinder. Lower the boom and arm until the attachment is on the ground and the X-Change pins are disengaged from the attachment hooks.
7. Move the arm toward the excavator until the X-Change pins are clear of the attachment.

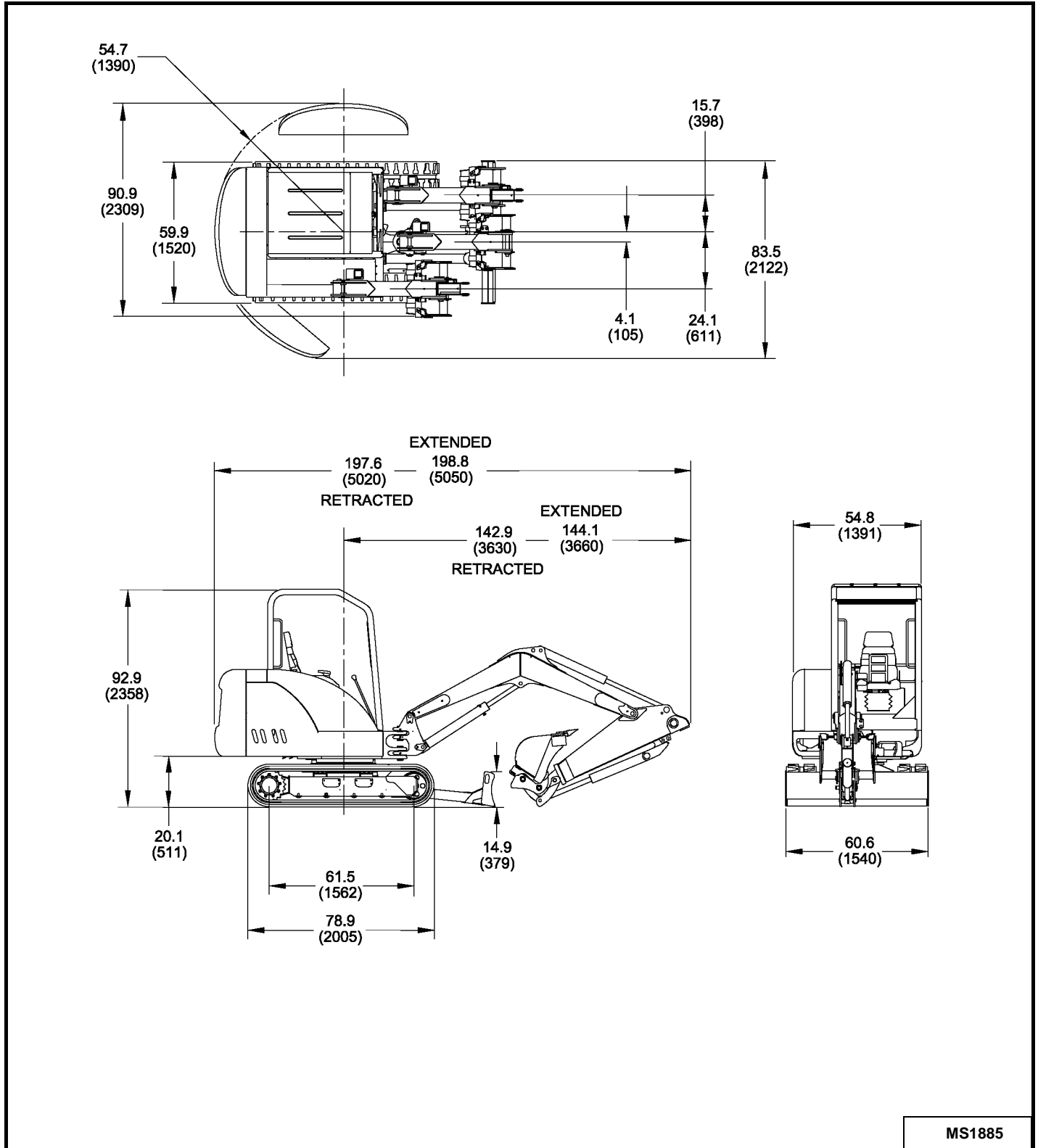
SEE OPERATION & MAINTENANCE MANUAL FOR MORE INSTRUCTIONS

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EXCAVATOR SPECIFICATIONS (CONT'D)

331 W / Extendable Arm & 331E Excavator Machine Dimensions

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



MS1885

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