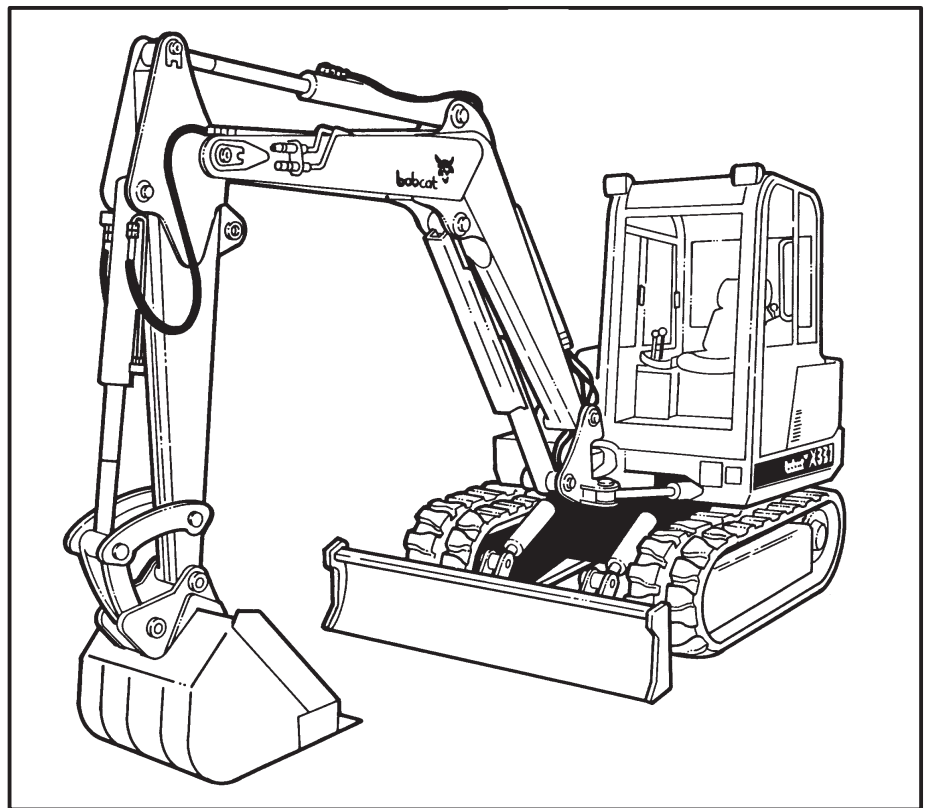


X 337 X 341

Excavator

Service Manual

337 (S/N 515411001 & Above)
341 (S/N 230611001 & Above)



MELROE
INGERSOLL-RAND

6900380(10-97)

Printed in U.S.A.



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MAINTENANCE SAFETY



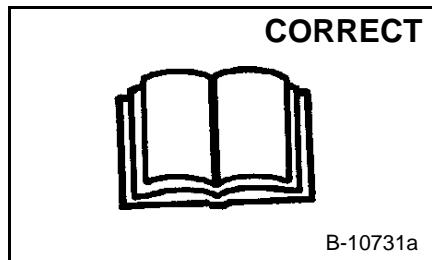
WARNING

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

W-2003-0903

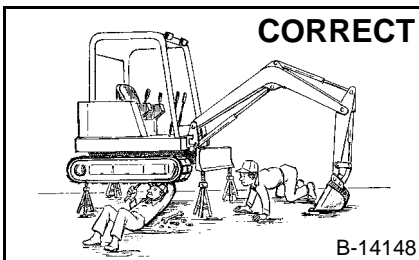


Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



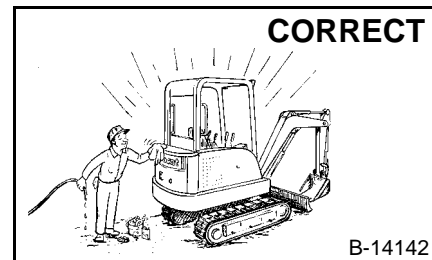
B-10731a

- ⚠ Never service the Bobcat Hydraulic Excavator without instructions.



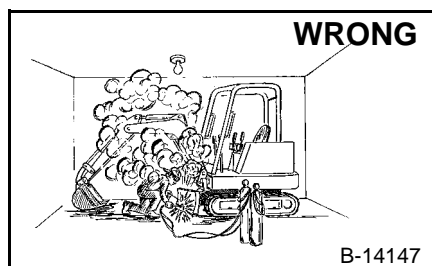
B-14148

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



B-14142

- ⚠ Cleaning and maintenance are required daily.



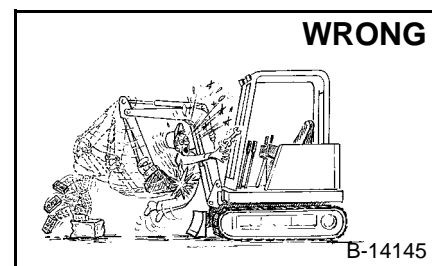
B-14147

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



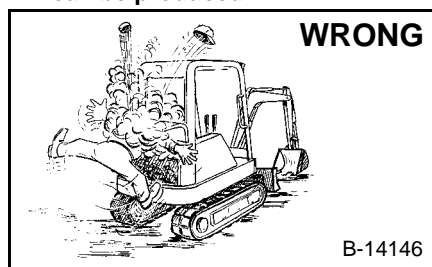
B-14141

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



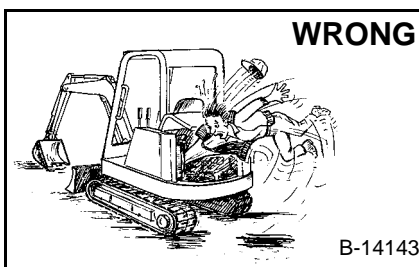
B-14145

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



B-14146

- ⚠ Stop, cool and clean engine of flammable materials before checking fluids.
- ⚠ Never service or adjust machine with the engine running unless instructed to do so in the manual.
- ⚠ Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.
- ⚠ Never fill fuel tank with engine running, while smoking or when near open flame.



B-14143

- ⚠ Keep body, jewelry and clothing away from moving parts, electrical contact, hot parts and exhaust.
- ⚠ Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protection approved for type of welding.
- ⚠ Keep rear door closed except for service. Close and latch door before operating the excavator.



B-6589

- ⚠ Lead-acid batteries produce flammable and explosive gases.
- ⚠ Keep arcs, sparks, flames and lighted tobacco away from batteries.
- ⚠ Batteries contain acid which burns eyes or skin on contact. Wear protective clothing. If acid contacts body, flush well with water. For eye contact flush well and get immediate medical attention.

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

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Enter the link into your browser.

The full manual is available for immediate download.

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**PREVENTIVE
MAINTENANCE**

**HYDRAULIC
SYSTEM**

**DRIVE
SECTION**

**UPPER WORKS
& SWING
SECTION**

**MAIN FRAME
& TRACKS**

**ELECTRICAL
SYSTEM**

**ENGINE
SERVICE**

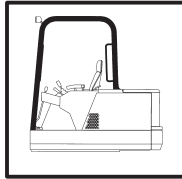
**TECHNICAL
DATA**

FOREWORD

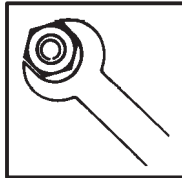
This manual is for the Bobcat hydraulic excavator mechanic. It provides necessary servicing and adjustment procedures for the hydraulic excavator and its component parts and systems. Refer to the Operation & Maintenance Manual for operating instructions, starting procedure, daily checks, etc.

A general inspection of the following items must be made after the hydraulic excavator has had service or repair:

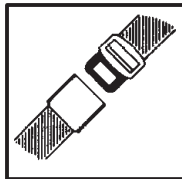
1. Check that the ROPS/TOPS/FOGS is in good condition and is not modified.



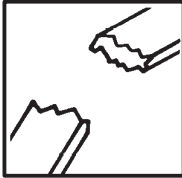
2. Check that ROPS/TOPS mounting hardware is tightened and is Melroe approved.



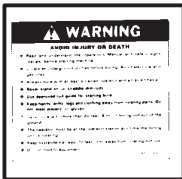
3. The seat belt must be correctly installed, functional and in good condition.



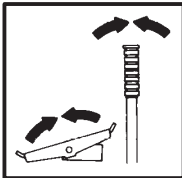
4. Inspect for loose or broken parts or connections.



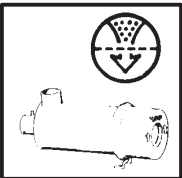
5. Machine signs must be legible and in the correct location.



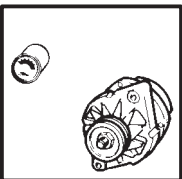
6. Steering levers, control levers and foot pedals must return to neutral. Check that foot pedals lock and control lever locks are in working condition.



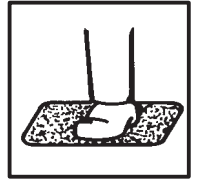
7. Inspect the air cleaner for damage or leaks. Check the condition of the element.



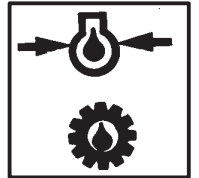
8. Check the electrical charging system.



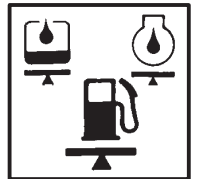
9. Safety treads must in good condition.



10. Check for correct function of indicator lamps (Optional on some models).



11. Check hydraulic fluid level, engine oil level and fuel supply.



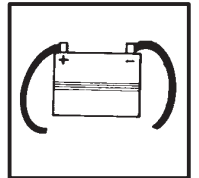
12. Inspect for fuel, oil or hydraulic fluid leaks.



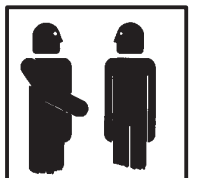
13. Lubricate the excavator.



14. Check the condition of the battery and cables.



Recommend to the owner that all necessary corrections be made before the machine is returned to service.



SAFETY INSTRUCTIONS

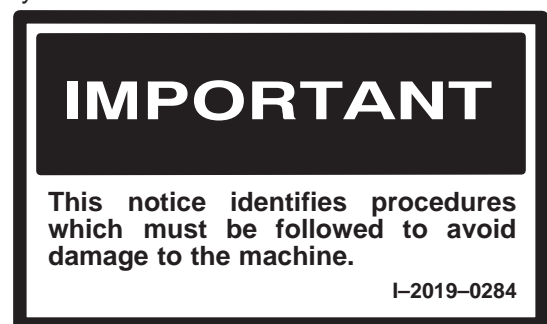
WARNING

Instructions are necessary before operating or servicing machine. Read 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-2003-0797

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

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



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

SAFETY INSTRUCTIONS (Cont'd)

- Wear tight fitting clothing and any other required safety apparel when operating or servicing the excavator.
- Wear safety glasses when maintaining or servicing the excavator.
- Exhaust gases can kill, vent engine exhaust outdoors.
- Know where fire extinguisher and first aid kits are located and how to use them.
- Do not run the excavator where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.
- 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 an engine that has glow plugs. These starting aids can explode and injure you.
- Clean the excavator before doing any welding. Remove both battery cables (negative (-) cable first). Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the excavator when welding.
- Have good ventilation when welding or grinding painted parts. Wear a 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 procedures in this manual for installing, connecting and jump starting batteries.



Call Before You Dig 1-888-258-0808

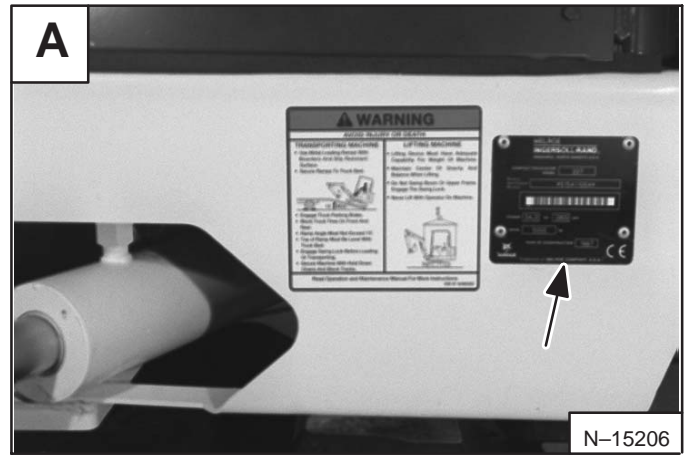
When you call, you will be directed to a location in your state/city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.).

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.

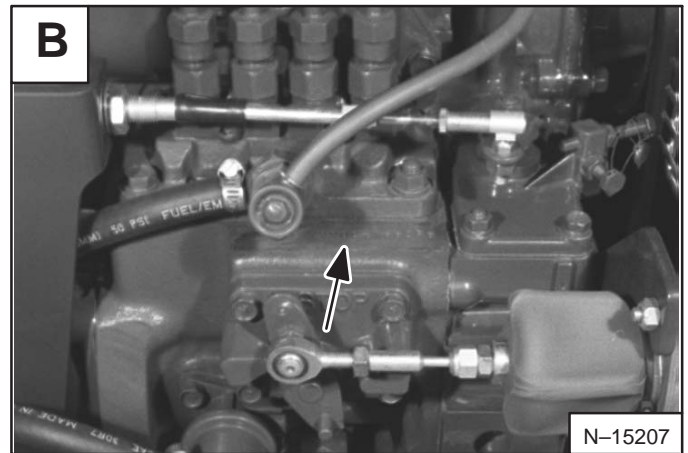
HYDRAULIC EXCAVATOR SERIAL NUMBER

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



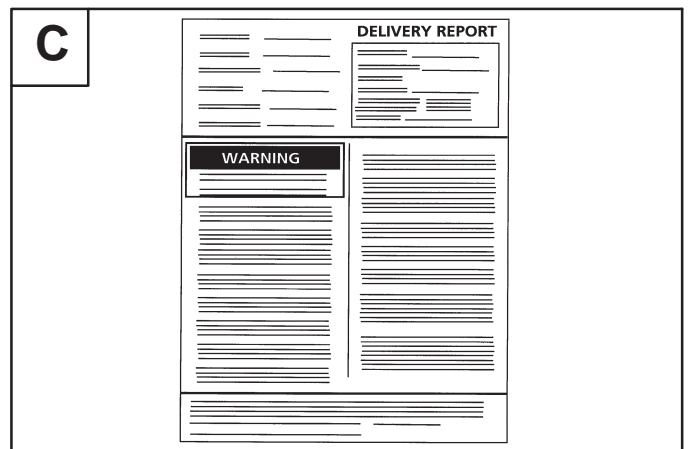
ENGINE SERIAL NUMBER

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

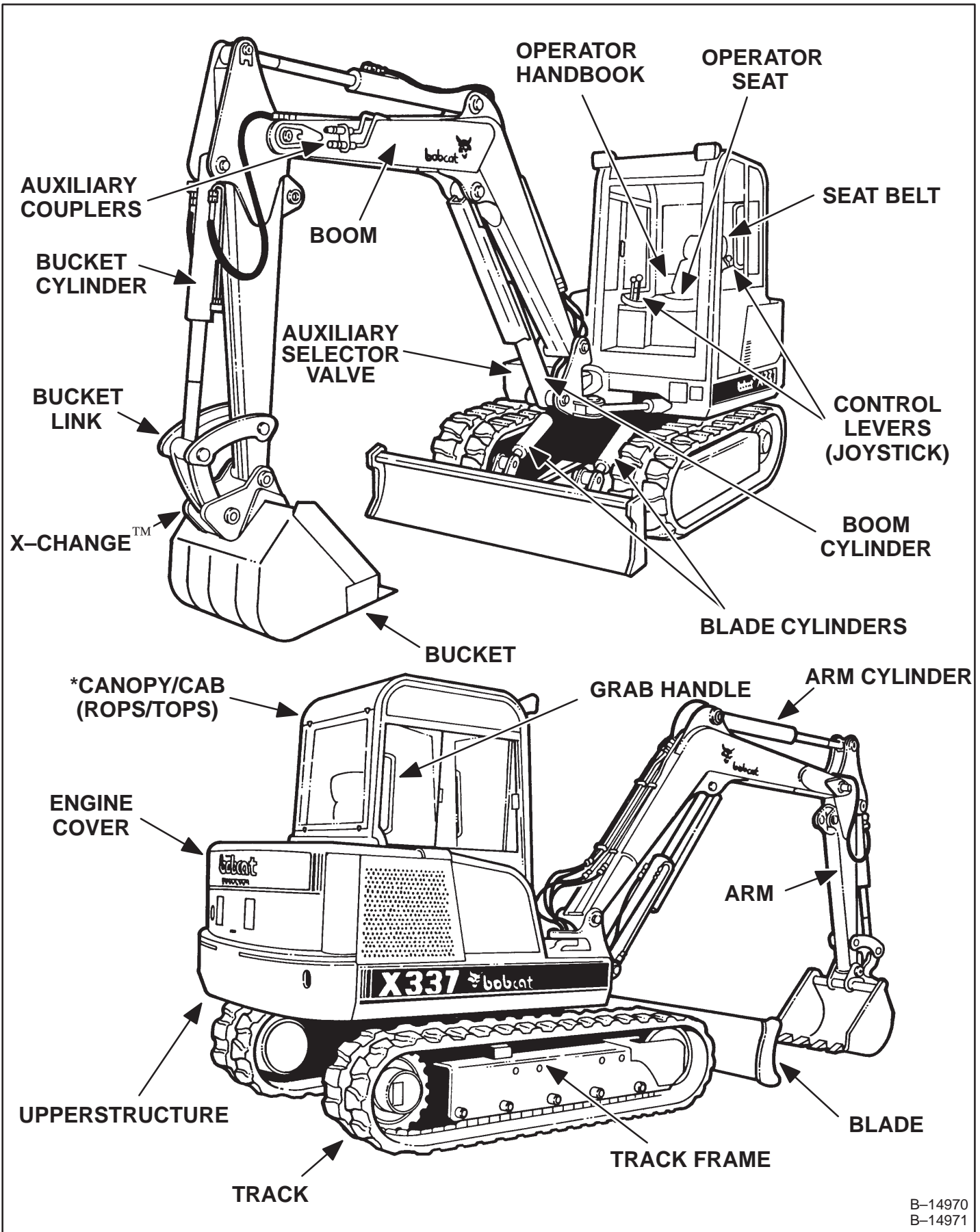


DELIVERY REPORT

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].



HYDRAULIC EXCAVATOR IDENTIFICATION



B-14970
B-14971

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

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**PREVENTIVE
MAINTENANCE**

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 Operation & Maintenance Manuals, 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-2003-0797

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 29 grease fittings. For excavators equipped with optional lifting clamp there are 33 grease fittings.						
Hyd. Fluid, Hoses & Tubelines	Check fluid level and add as needed. Check for damage and leaks. Repair and replace as needed.						
Battery	Check cables, connections and electrolyte level. Add distilled water as needed.						
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.						
Spark Arrestor Muffler	Clean spark chamber (if equipped).						
Alternator/Fan Belt	Check and adjust tension.		*				
Engine Oil & Filter	Replace oil and filter element.		*				
Travel Motors	Check fluid level and add oil as needed.						
Fuel Filter	Replace filter element.						
Cooling System	Clean the radiator fins.						
Alternator & Starter	Check the condition of connections.						
Hydraulic Filter	Replace filter element.			**			
Case Drain Filter	Replace filter element						
Cooling System	Drain, flush and add new coolant to the cooling system.						
Hydraulic Tank	Change the fluid, clean fill neck strainer.						
Travel Motors	Change the oil.			**			
Cab Heater Air Filter	Clean the filter.						

*Perform after the first 50 hours of machine operation.

Replace the engine oil and filter.

Check the condition of the alternator/fan belt.

**Perform after the first 100 hours of machine operation.

Change oil in travel motors.

Replace hydraulic filter.

■ Or Every 12 Months.



WARNING

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W-2003-0797

LIFTING AND BLOCKING THE EXCAVATOR

Procedure

Always park the machine on a level surface.



WARNING

Put jackstands under the blade and track frame before running the engine for service. Failure to use jackstands can allow the machine to fall or move and cause injury or death.

W-2017-0286

Raise the machine using the boom and arm [A].

Fully raise the blade and install jackstands under the blade [A] and track frame [B].

Lower the boom until all the machine weight is on the jackstands.

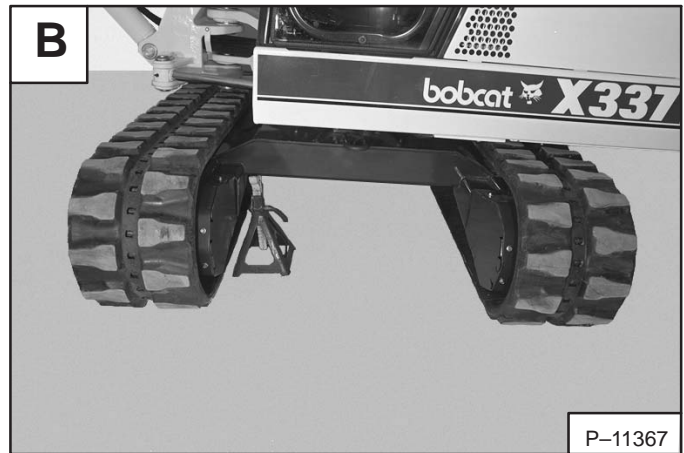
Repeat the procedure for the other side.

Stop the engine.

A



B



TRANSPORTING THE HYDRAULIC EXCAVATOR

Procedure

- 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.
- 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 on 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 to 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 safely 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

Steel loading ramps are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

W-2058-0887



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 this manual.

W-2012-0290

Keep the engine cover closed when operating the machine.

W-2141-0189

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

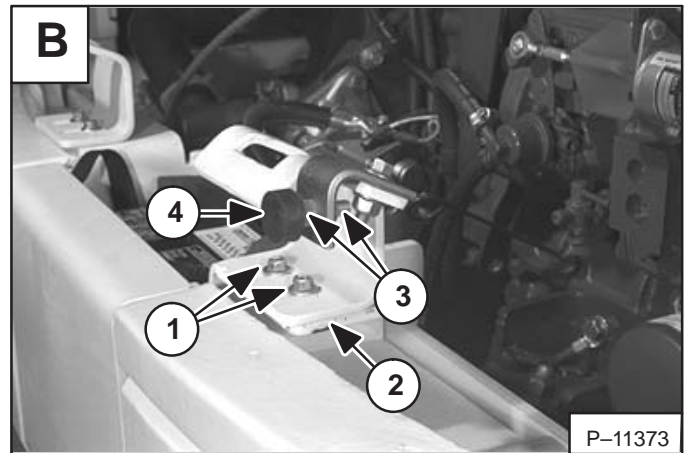
Adjusting The Engine Cover Latches

Open the engine cover.

NOTE: The right latch adjustment is shown. The procedure is the same for the left latch.

Loosen the two bolts (Item 1) [B] and adjust the striker plate (Item 2) [B] until it is in the correct position. Tighten the two bolts (Item 1) [B].

Loosen the nuts (Item 3) [B] and adjust the stop (Item 4) [B]. Tighten the nuts (Item 3) [B] when the stop (Item 4) [B] is in the correct position.



AIR CLEANER

Air Cleaner Service

See the *SERVICE SCHEDULE* Page 1–3 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) [A].

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

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

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

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

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

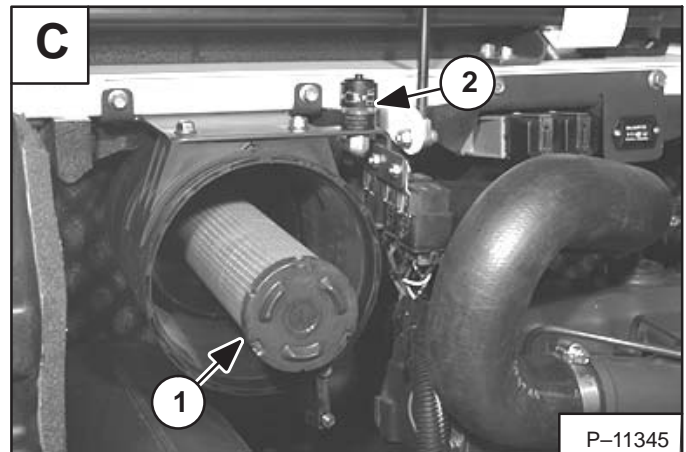
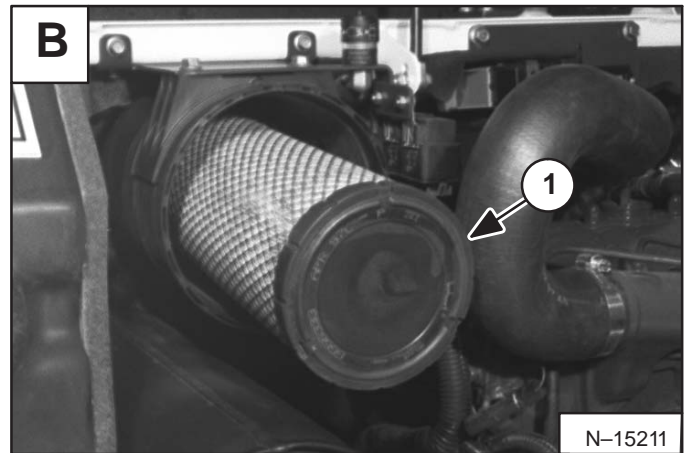
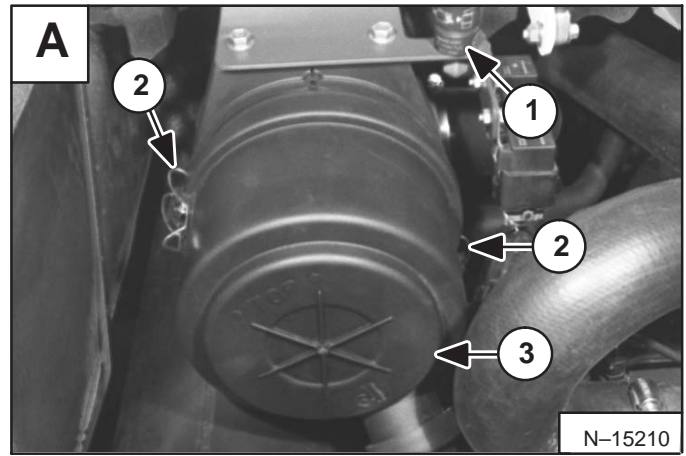
NOTE: Make sure all sealing surfaces are free of dirt and debris.

Only replace the inner filter element (Item 1) [C] 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) [C] 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 [D].



FUEL SYSTEM

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, contact your fuel supplier

WARNING

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

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Filling The Fuel Tank

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 3.0 gals. (11,3 L.) of fuel, the low fuel light (Item 2) [A] will come ON to alert the operator of this condition.

Open the engine cover. The fuel fill cap (Item 1) [B] is located in the right rear corner of the excavator.

Turn the fuel cap to remove it.

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 the engine cover.

Fuel System Maintenance

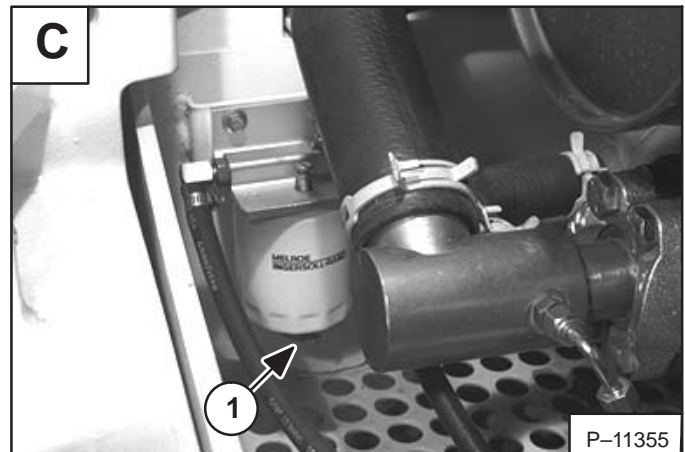
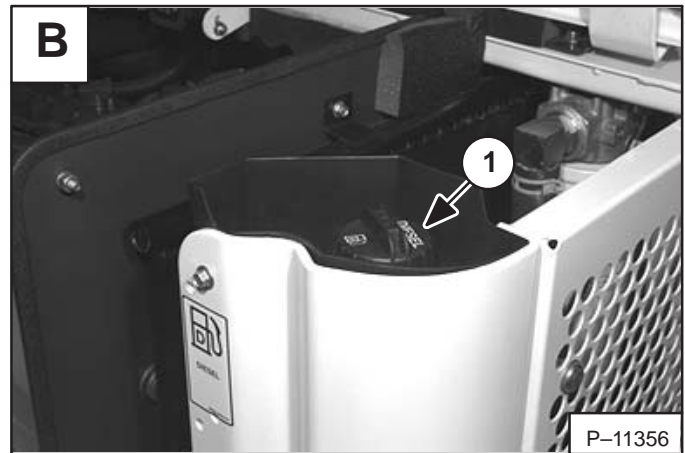
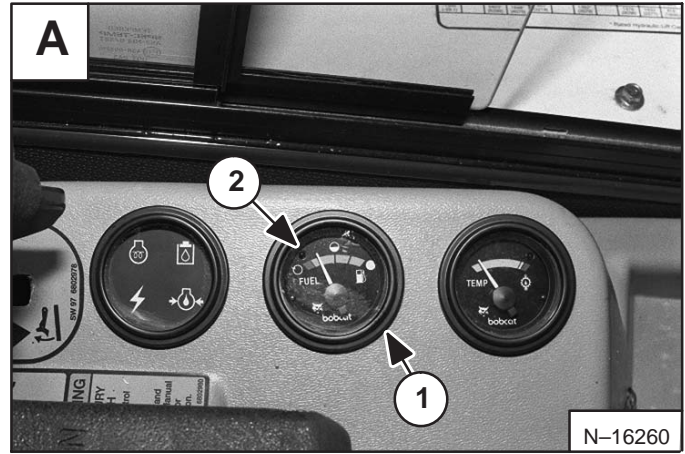
See the *SERVICE SCHEDULE* Page 1-3 for the correct service intervals.

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

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

Open the drain valve (Item 1) [D] at the bottom of the fuel tank. Drain contaminated fuel into a container.

Tighten the drain when all the water has been removed.



FUEL SYSTEM (Cont'd)

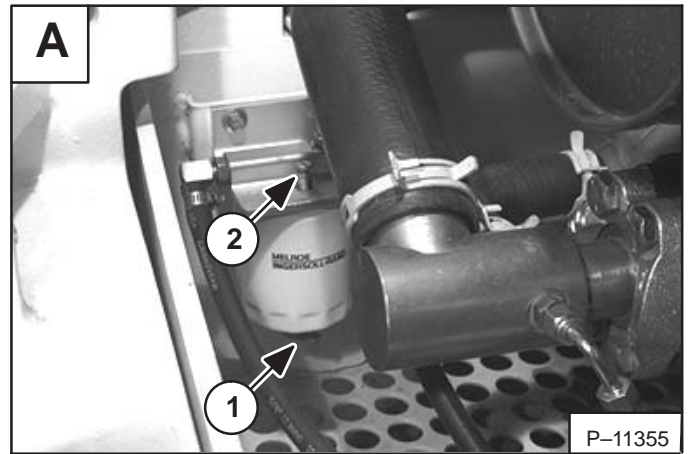
Fuel Filter Service

See the *SERVICE SCHEDULE* Page 1–3 for the service interval when to replace the fuel filter.

Remove the filter element (Item 1) **[A]**.

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

Remove the air from the fuel filter. (See *Removing Air From The Fuel System*.)



Removing Air From The Fuel System

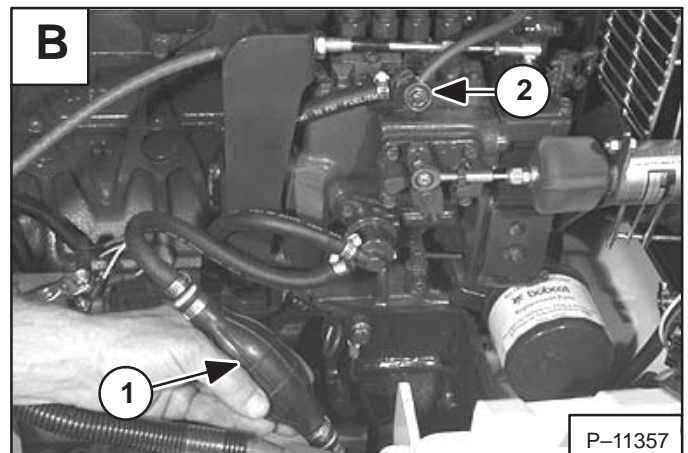
After replacing the fuel filter or when the fuel tank has run out of fuel, the air must be removed from the fuel system before starting the engine.

Open the vent (Item 2) **[A]** on the fuel filter housing.

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

Tighten the vent plug (Item 2) **[A]**.

Start the engine. It may be necessary to open the vent (Item 2) **[B]** at the fuel injection pump. Close the valve after the engine starts running smoothly.



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

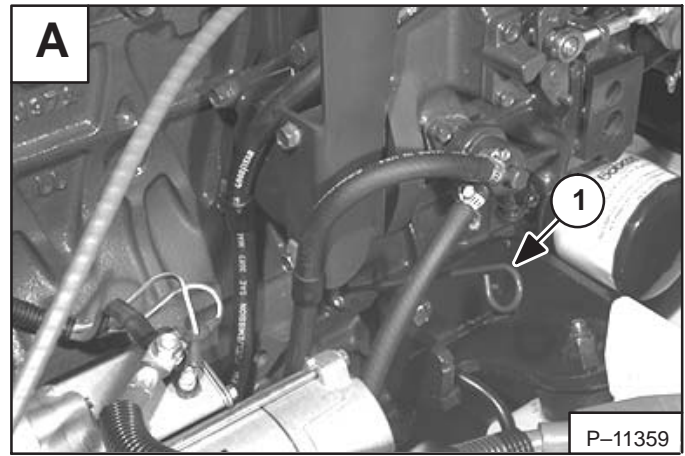
Check the engine oil every day.

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 8–1.)



Replacing Oil And Filter

See the *SERVICE SCHEDULE* Page 1–3 for the correct service interval.

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

Open the rear cover.

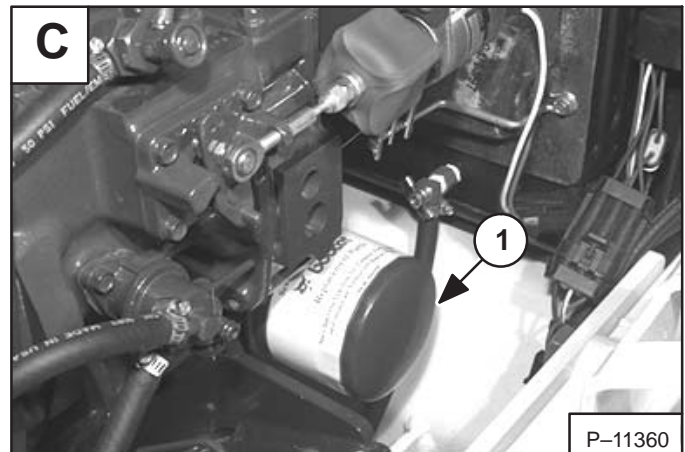
Remove the drain plug (Item 1) [B] from the oil pan.
Drain the oil into a container.



Remove the oil filter (Item 1) [C], using a filter wrench.

Clean the filter housing surface. Put clean oil on the filter gasket. Install the new filter and hand tighten only.

Install and tighten the oil drain plug.

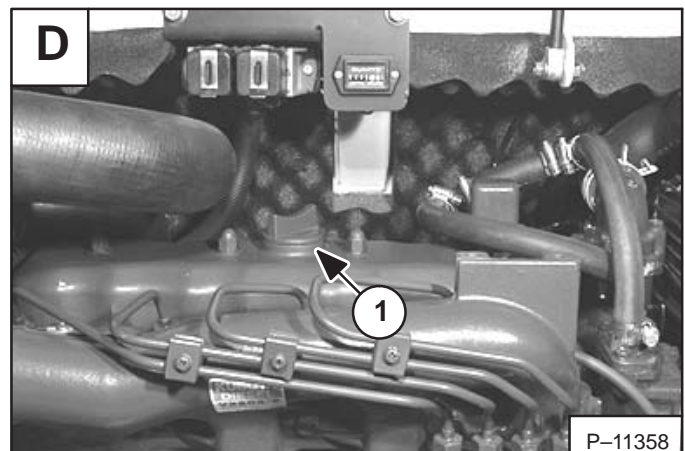


Remove the oil fill cap (Item 1) [D]. Put 7.5 qts. (7,1 L.) of oil into the engine. (See *FUEL, COOLANT AND LUBRICANTS Chart*, Page 8–1.)

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.

Check the oil level and add oil as needed if it is not at the top mark on the dipstick.





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COOLING SYSTEM

Coolant Level

When the engine is cool, the coolant level in the recovery tank (Item 1) [A] must be between the minimum and maximum marks on the recovery tank.

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

Replacing Coolant

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.

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

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

Propylene Glycol (Factory Installed)

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

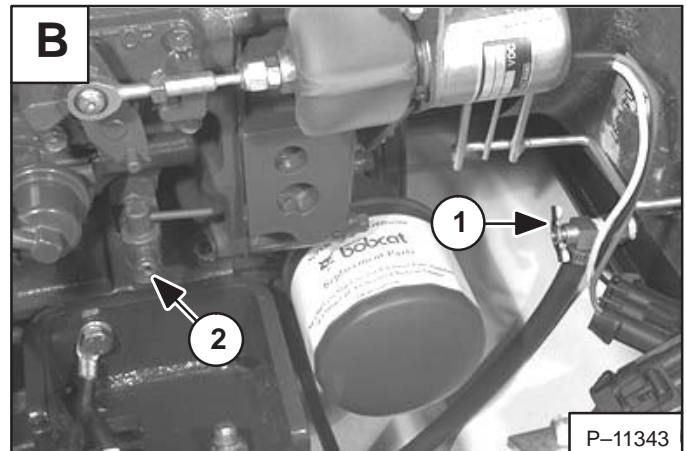
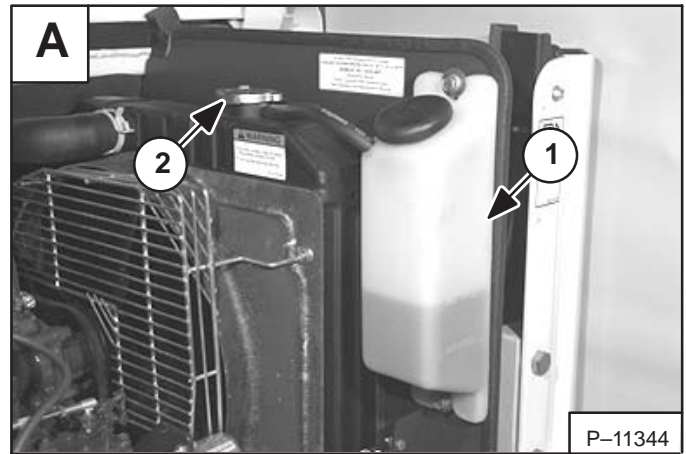
One gallon and one pint of propylene glycol mixed with one gallon of water is the correct mixture of coolant to provide a -34°F (-37°C) freeze protection.

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

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.



WARNING

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

W-2070-1285

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