

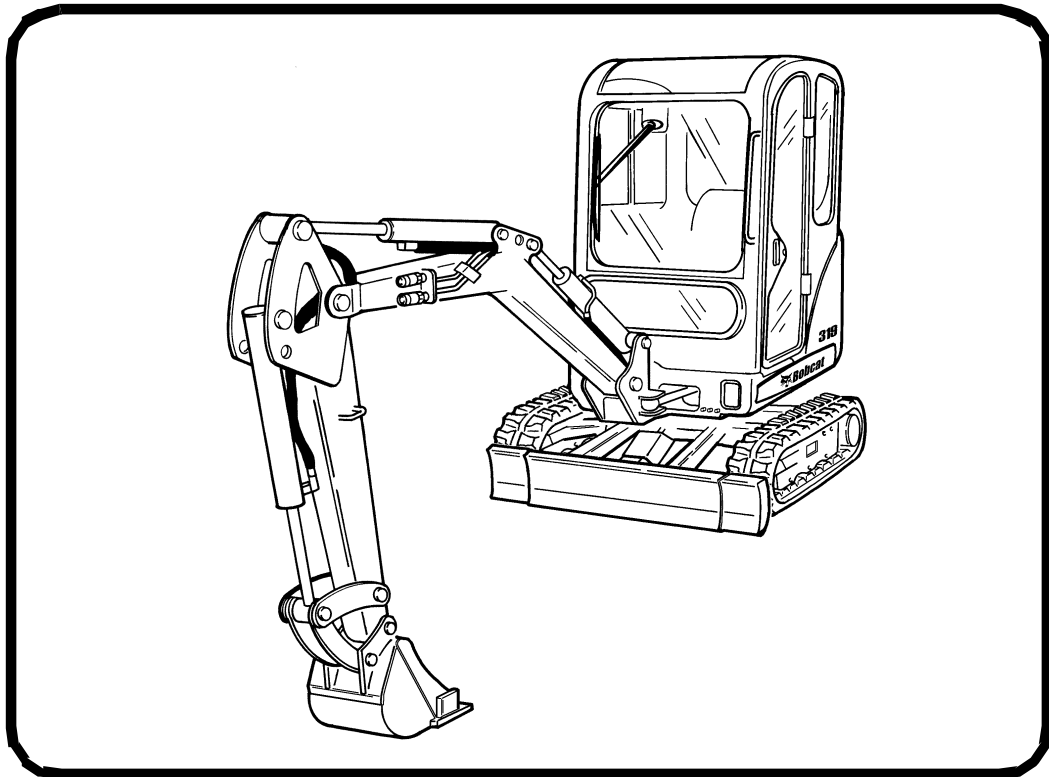


Bobcat®

Service Manual

319 Compact Excavator

S/N 563311001 & Above



MAINTENANCE SAFETY



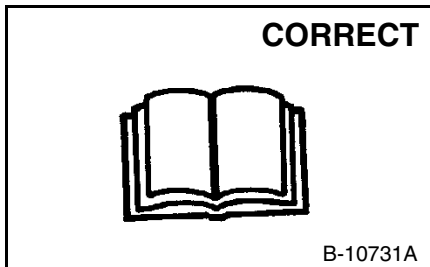
WARNING

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

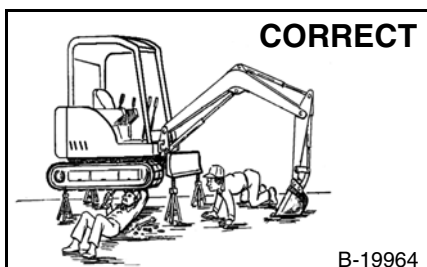


Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



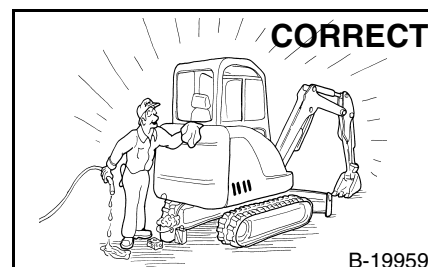
B-10731A

- ⚠ Never service the Bobcat Compact Excavator without instructions.



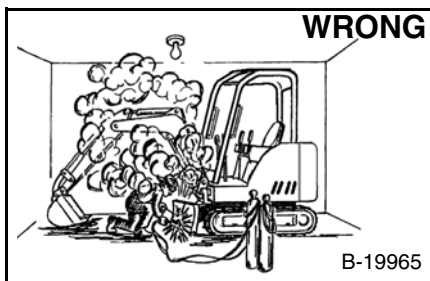
B-19964

- ⚠ Use the correct procedure to lift and support the excavator.



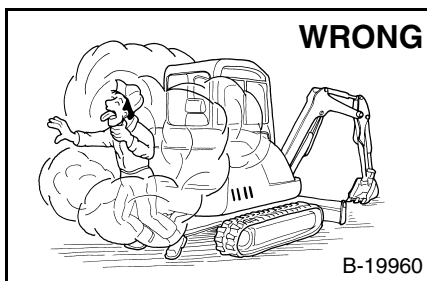
B-19959

- ⚠ Cleaning and maintenance are required daily.



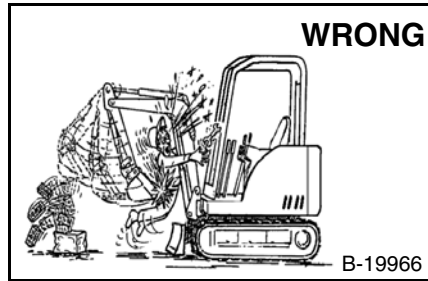
B-19965

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



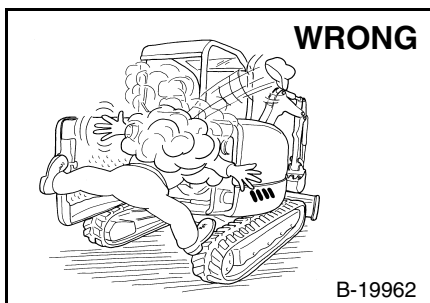
B-19960

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



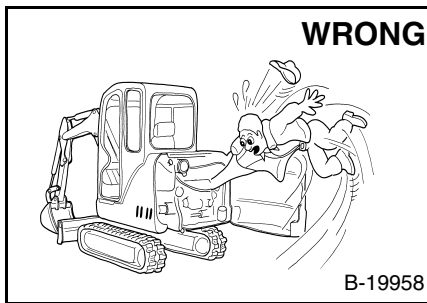
B-19966

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



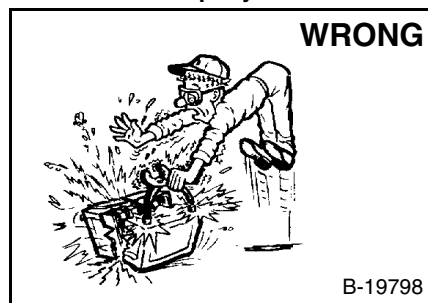
B-19962

- ⚠ 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-19958

- ⚠ 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 protections approved for type of welding.
- ⚠ Keep tailgate closed except for service. Close and latch tailgate before operating the excavator.



B-19798

- ⚠ 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.

MSW28-0805

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**SAFETY AND
MAINTENANCE**

**HYDRAULIC
SYSTEM**

**UNDER-
CARRIAGE**

**UPPER-
STRUCTURE &
SWING SECTION**

**ELECTRICAL
SYSTEM AND
ANALYSIS**

**ENGINE
SERVICE**

HEATER

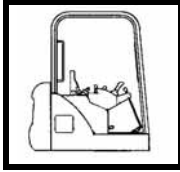
SPECIFICATIONS

FOREWORD

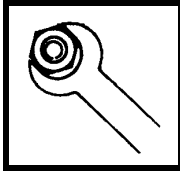
This manual is for the Bobcat Hydraulic Excavator mechanic. It provides necessary servicing and adjustment procedures for the hydraulic excavator and its component parts and systems. Refer to the Operation & Maintenance Manual for operating instructions, starting procedure, daily checks, etc.

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

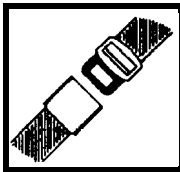
1. Check that the ROPS/TOPS/FOGS is in good condition and is not modified.



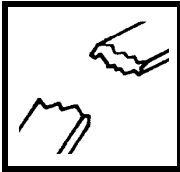
2. Check that ROPS/TOPS mounting hardware is tightened and is Bobcat approved.



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



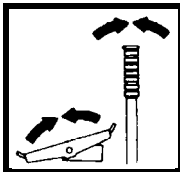
4. Inspect for loose or broken parts or connections.



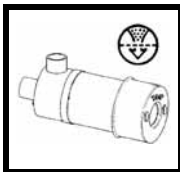
5. Machine signs must be legible and in the correct location.



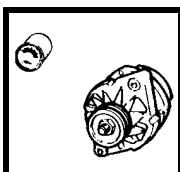
6. Steering levers, control levers and foot pedals must return to neutral. Check that foot pedals lock and control lever locks are in working order.



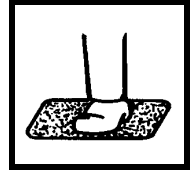
7. Inspect the air cleaner for damage or leaks. Check the condition of the element.



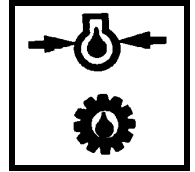
8. Check the electrical charging system.



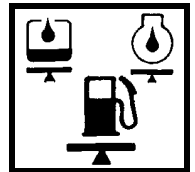
9. Safety treads must be in good condition.



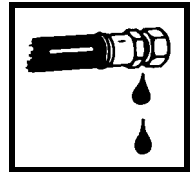
10. Check for correct function of indicator lamps (Optional on some models).



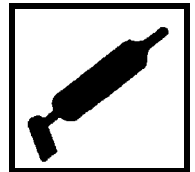
11. Check hydraulic fluid level, engine oil level and fuel supply.



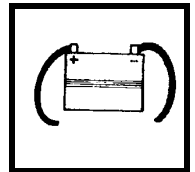
12. Inspect for fuel, oil or hydraulic fluid leaks.



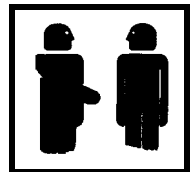
13. Lubricate the excavator.



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.



**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.

SAFETY INSTRUCTIONS



Safety Alert Symbol

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



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



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

IMPORTANT

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

I-2019-0284

The following publications provide information on the safe use and maintenance of the Bobcat machine 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 machine or attachment contains 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 on the machine. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat machine 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 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 AEM Safety Manual delivered with the machine gives general safety information.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.
- The Compact Excavator Operator Training Course is available through your local dealer or at www.training.bobcat.com or www.bobcat.com. This course is intended to provide rules and practices of correct operation of the Bobcat Excavator. The course is available in English and Spanish versions.
- Service Safety Training Courses are available from your Bobcat dealer or at www.training.bobcat.com or www.bobcat.com. They provide information for safe and correct service procedures.
- The Bobcat Compact Excavator Safety Video is available from your Bobcat dealer or at www.training.bobcat.com or www.bobcat.com.

SI EXC-0206 SM

SAFETY INSTRUCTIONS (CONT'D)

Fire Prevention

The machine and attachments have components that are at high temperature under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

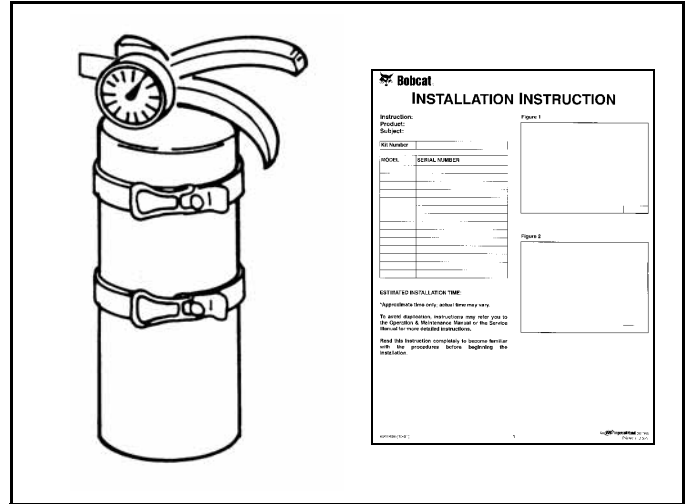
Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it will increase fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential hazard.

The spark arrestor muffler is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

- 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 hazard 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 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 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 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).

Figure 1



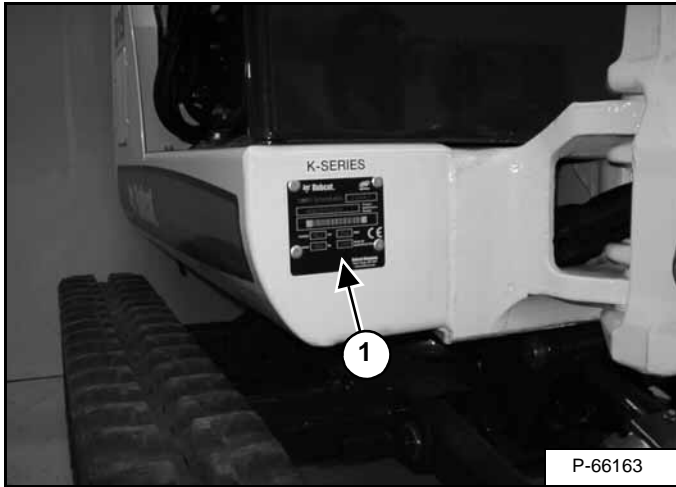
- Know where fire extinguishers and first aid kits are located and how to use them. Fire extinguishers are available from your Bobcat dealer [Figure 1].

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.

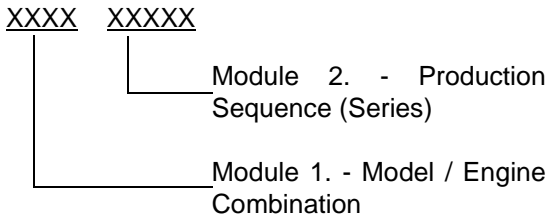
Excavator Serial Number

Figure 1



The excavator serial number plate (Item 1) [Figure 1] is located on the front right hand corner of the frame.

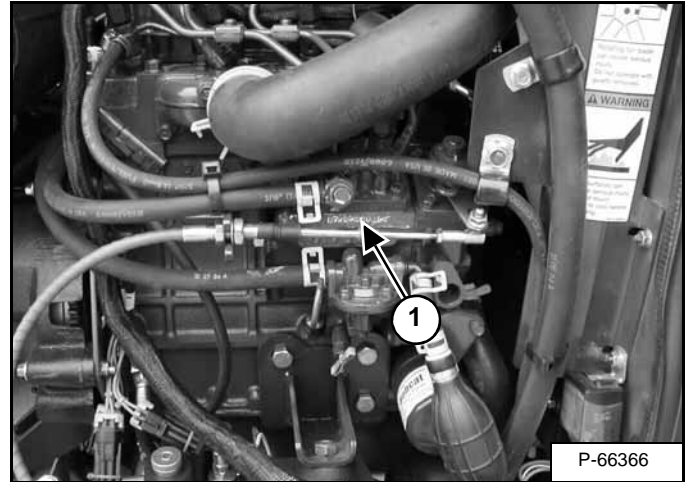
Explanation of Excavator Serial Number:



1. The 4 digit Model/Engine Combination Module number identifies the model number and engine combination.
2. The 5 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 side of the engine.

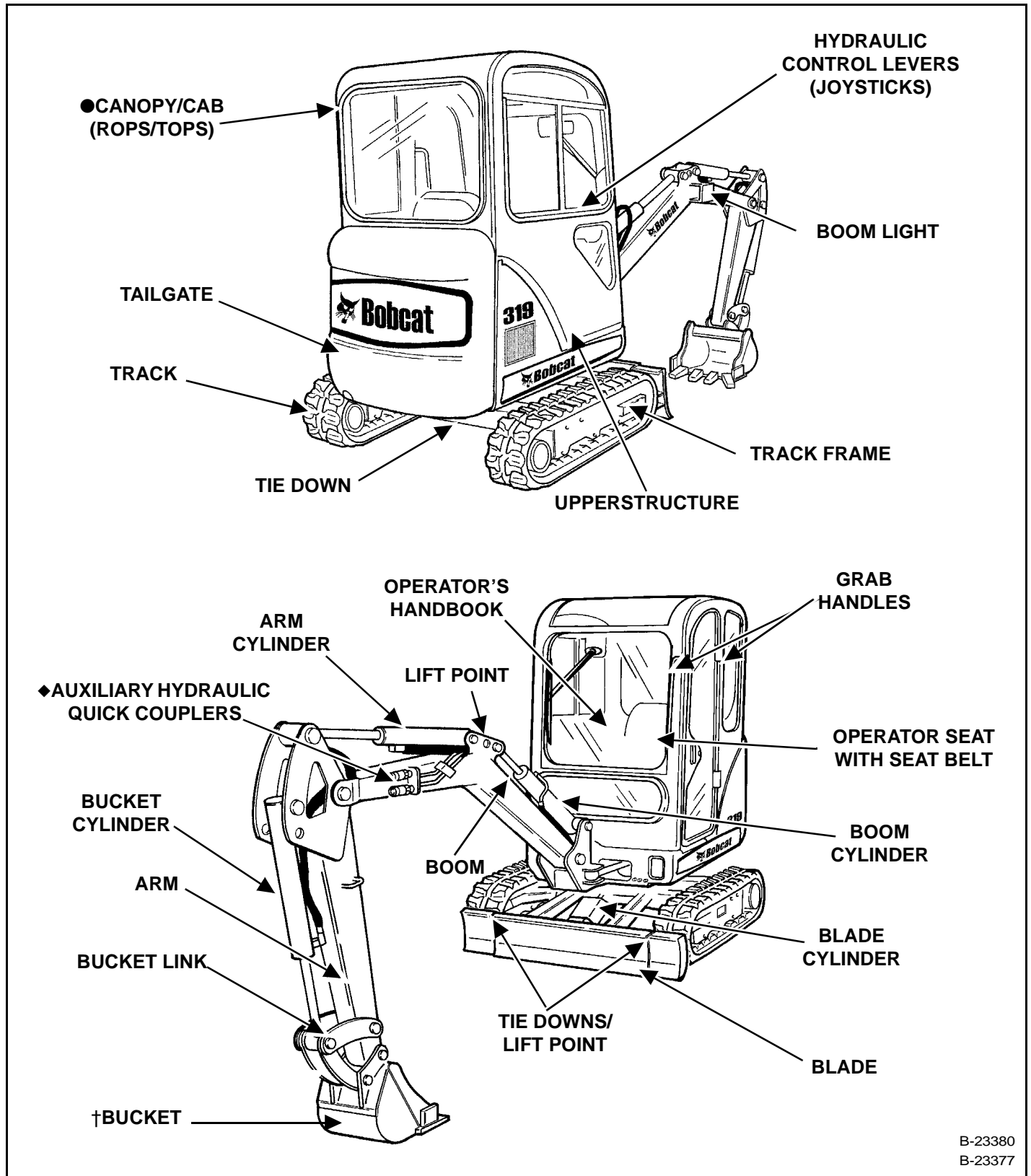
DELIVERY REPORT

Figure 3

The diagram shows a form titled "DELIVERY REPORT". The form is divided into several sections. At the top, there is a header section with the title "DELIVERY REPORT" and several lines of text. Below this, the form is split into two columns. The left column contains a section with a dark background and the word "WARNING" in white, followed by several lines of text. The right column contains several lines of text. At the bottom of the form, there is a small box containing the text "B-16315".

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]**.

EXCAVATOR IDENTIFICATION



B-23380
B-23377

- ◆ OPTIONAL OR FIELD ACCESSORY (Not Standard Equipment)
- † BUCKET - Several different buckets and other attachments are available from the Bobcat Loader.
- ROPS, TOPS - (Roll Over Protective Structure / Tip Over Protective Structure) as standard equipment. The ROPS/TOPS meets SAE J1040, ISO 3471 and ISO 12117.

SAFETY AND MAINTENANCE

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LIFTING AND BLOCKING THE EXCAVATOR

Procedure

Always park the machine on a level surface.

Figure 10-10-1



Raise one side of the machine (approximately 4 in.) using the boom and arm as shown in **[Figure 10-10-1]**.

Raise the blade fully and install jackstands under the blade and the track frame. Lower the machine until all machine weight is on the jackstands.

Stop the engine.

WARNING

Put jackstands under the blade and rear corners of the undercarriage before working under the machine. Failure to block up the machine may allow it to move or fall and result in injury or death.

W-2218-1195

WARNING

AVOID INJURY

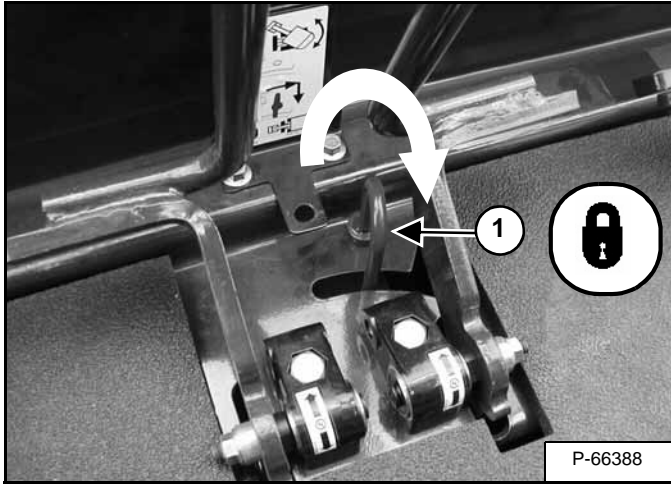
Keep fingers and hands out of pinch points when checking the track tension.

W-2142-0903

UPPERSTRUCTURE SLEW LOCK

Operation

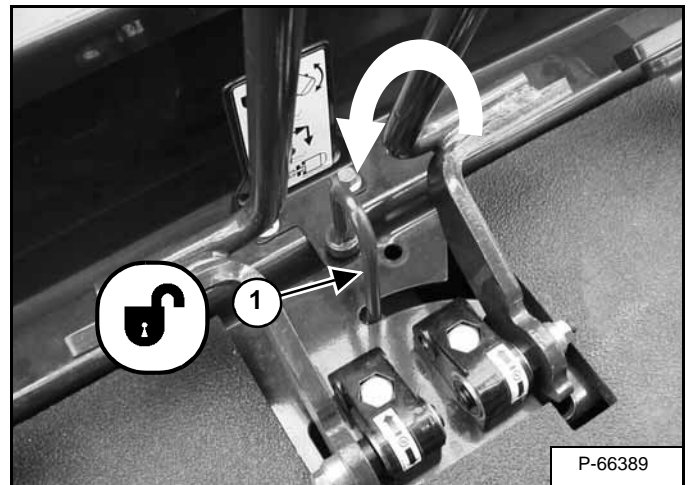
Figure 10-11-1



Move the lever (Item 1) [Figure 10-11-1] *down* to engage the Slew Lock. When the Slew Lock is engaged (locked), the upperstructure of the excavator is locked to the track frame and will not rotate. The upper structure must be parallel to the track frame to engage the Slew Lock.

NOTE: The upperstructure must be in the straight forward or straight rearward position for the upperstructure to lock.

Figure 10-11-2



Move the lever (Item 1) [Figure 10-11-2] *up* to disengage the upperstructure from the track frame. Secure the lever in the unlocked position.

! WARNING

AVOID INJURY

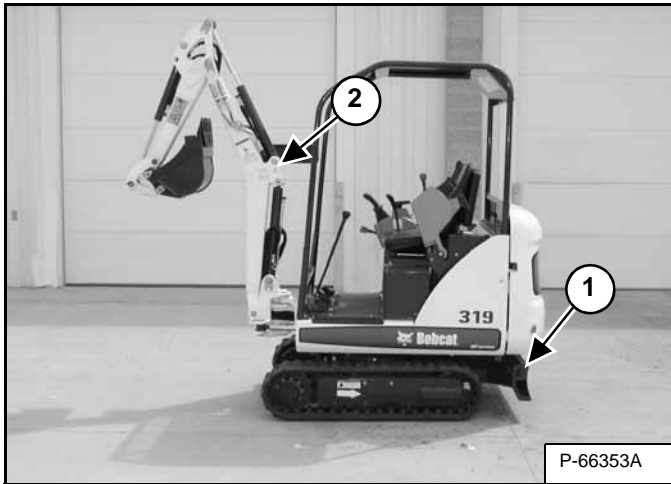
The upperstructure slew lock lever must be engaged when transporting the machine.

W-2197-0904

LIFTING THE EXCAVATOR

Procedure

Figure 10-12-1



Fully extend the bucket and arm cylinders, and fully retract the boom cylinder so that the excavator is in the position shown [Figure 10-12-1].

Engage the UPPERSTRUCTURE SLEW LOCK. (See Operation on Page 10-11-1.)

Raise the blade all the way.

Put all the control levers in neutral.

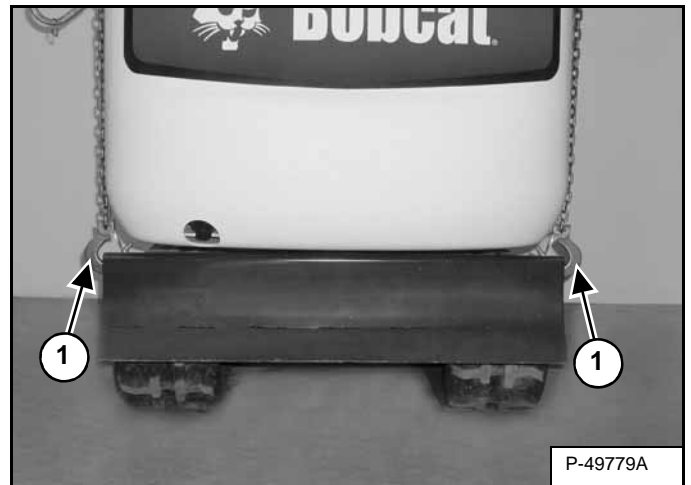
WARNING

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.

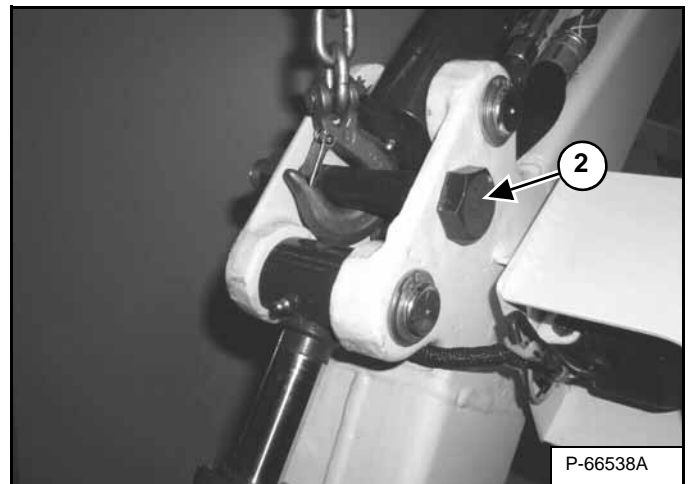
W-2202-0595

Figure 10-12-2



Fasten chains to the ends of the blade (Item 1) [Figure 10-12-1] and [Figure 10-12-2] and up to a lifting fixture above the canopy/cab. The lifting fixture must extend over the sides of the canopy/cab to prevent the chains from hitting the ROPS/TOPS.

Figure 10-12-3



Install a 1 in. (25 mm) bolt and nut (Grade 5 or 8) through the holes at the boom (Item 2) [Figure 10-12-1] and [Figure 10-12-3]. Fasten a chain from the bolt to the lift fixture.

OPERATOR CAB (ROPS / TOPS)

Description

The excavator has an optional operator cab (ROPS/TOPS) (Roll Over Protective Structure/Tip Over Protective Structure). The ROPS/TOPS meets SAE J1040, ISO 3471 and ISO 12117.

An enclosed cab (ROPS/TOPS) is an Option or can be installed as a Field Accessory.

Both the cab and canopy provide operator protection if the excavator is tipped over. The seat belt must be worn for ROPS /TOPS protection.

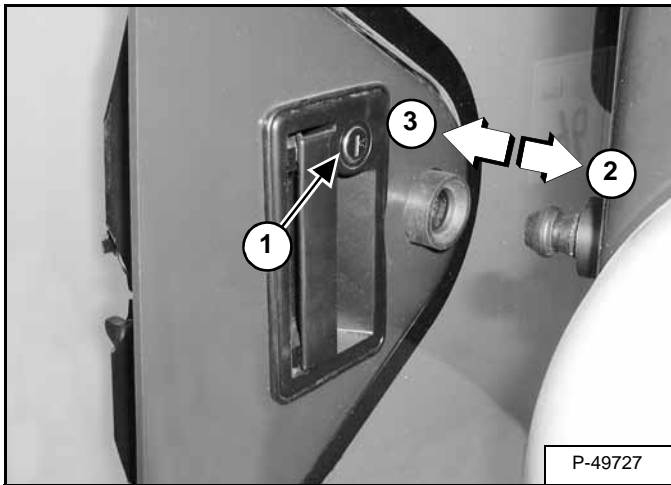


Never modify operator cab by welding, grinding, drilling holes or adding attachments unless instructed to do so by Bobcat Company. Changes to the cab can cause loss of operator protection from rollover and falling objects, and result in injury or death.

W-2069-0200

Cab Door

Figure 10-20-1



The cab door can be locked (Item 1) [Figure 10-20-1] with the same key as the starter switch.

Push the door all the way open (Item 2) [Figure 10-20-1] until the latch engages to hold the door in the open position.

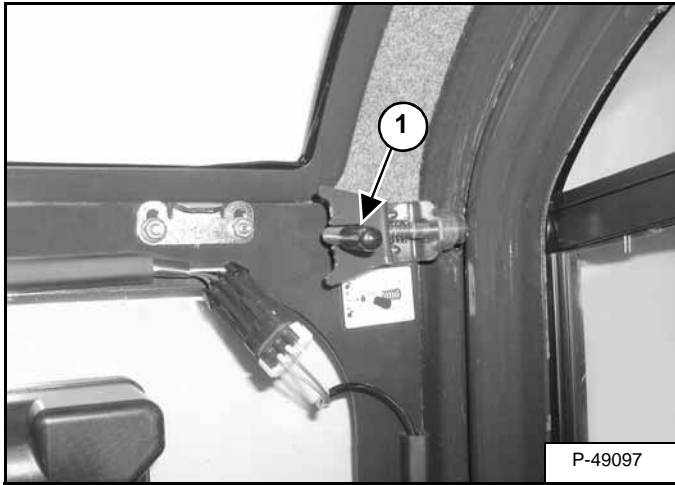
Pull the door away from the cab (Item 3) [Figure 10-20-1] to disengage the latch and close the door.

OPERATOR CAB (ROPS / TOPS) (CONT'D)

Front Window

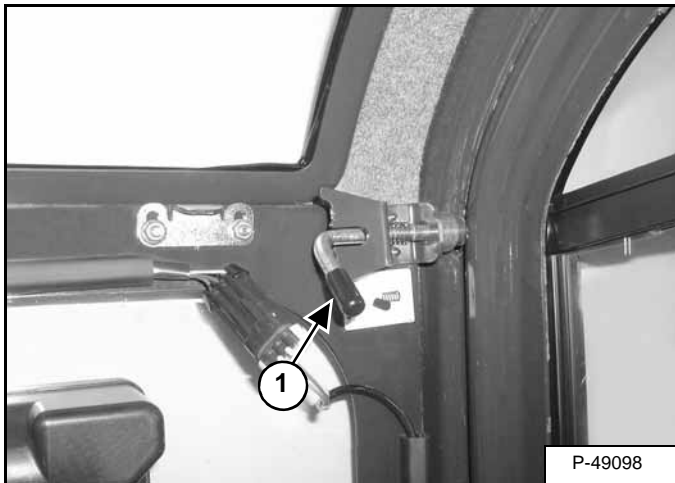
Opening The Front Window

Figure 10-20-2



Retract the 2 top window latch pins (Item 1) [Figure 10-20-2].

Figure 10-20-3



Turn the 2 top latches (Item 1) [Figure 10-20-3] to the unlocked position.

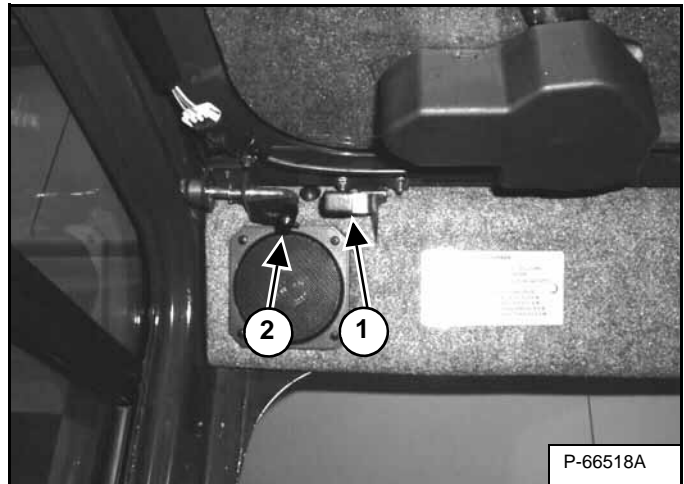
Figure 10-20-4



Use both window grab handles to pull the top of the window in [Figure 10-20-4].

Continue moving the window in and up over the operator's head until the window is fully raised.

Figure 10-20-5



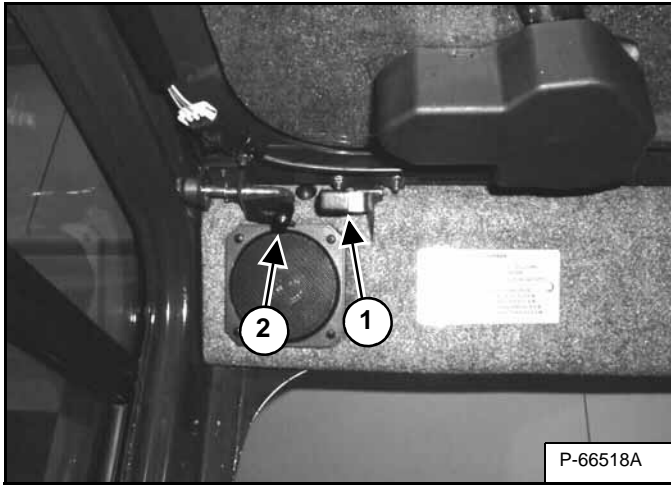
When the window is fully raised, the latch (Item 1) will close on the bracket. Turn the 2 top latches (Item 2) [Figure 10-20-5] to the locked position.

OPERATOR CAB (ROPS / TOPS) (CONT'D)

Front Window (Cont'd)

Closing The Front Window

Figure 10-20-6



Support the window while releasing both window latch pins and placing the pins in the unlocked position [Figure 10-20-6].

Support the window using the left grab handle and pull down on the latch (Item 1) [Figure 10-20-6] to release the window.

Figure 10-20-7



Use both window grab handles to pull the window down [Figure 10-20-7].

Figure 10-20-8

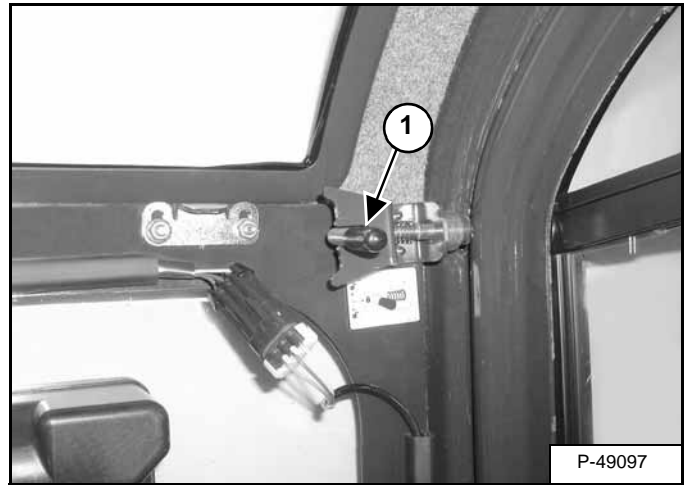
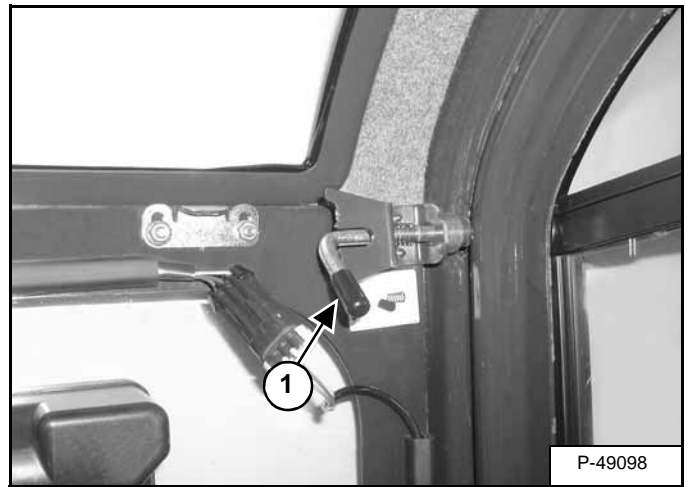


Figure 10-20-9



Rotate the top latches (Item 1) [Figure 10-20-9] to the locked position (Item 1) [Figure 10-20-8].

OPERATOR CAB (ROPS / TOPS) (CONT'D)

Front Wiper

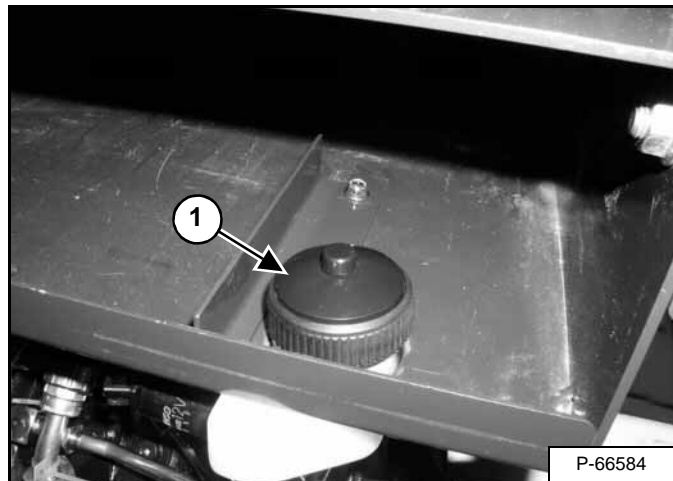
Figure 10-20-10



The front window is equipped with a wiper (Item 1) [Figure 10-20-10] and washer.

Window Washer Reservoir

Figure 10-20-11



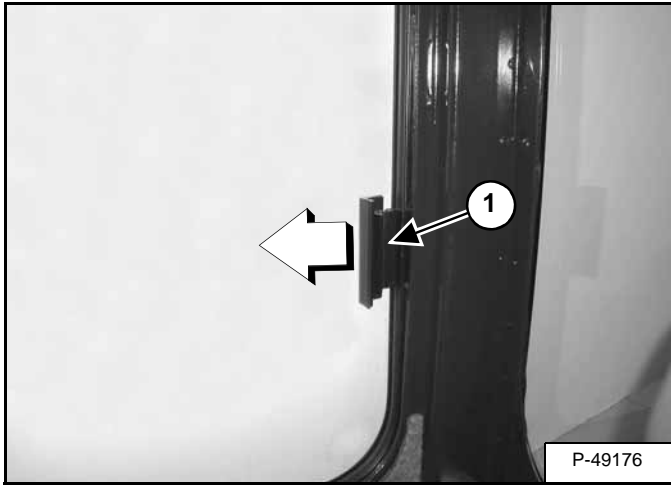
The window washer reservoir (Item 1) [Figure 10-20-11] is located under the operator seat.

OPERATOR CAB (ROPS / TOPS) (CONT'D)

Right Side Window

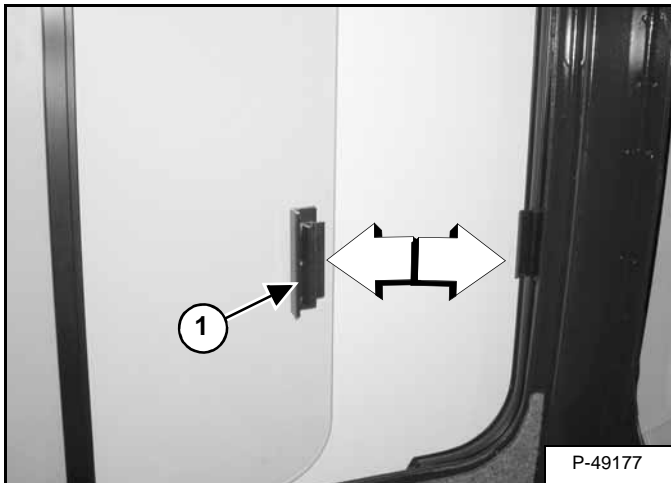
Opening the right rear window

Figure 10-20-12



Pull forward on the latch / handle (Item 1) [Figure 10-20-12].

Figure 10-20-13



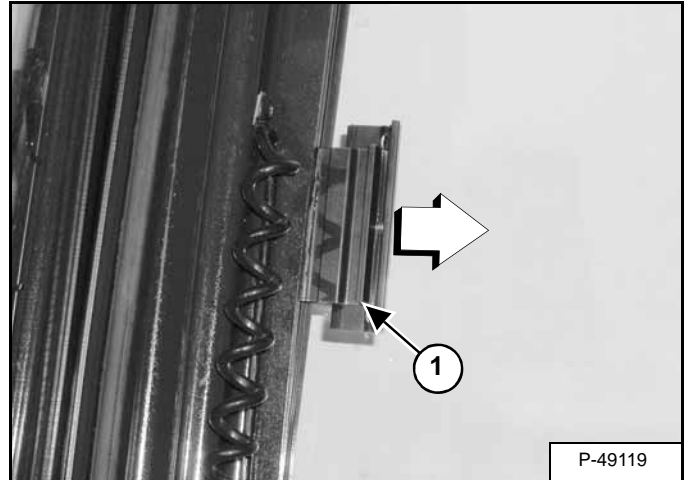
Pull the latch / handle (Item 1) [Figure 10-20-13] forward to open the window.

Closing the right rear window

Push the handle back to close the window.

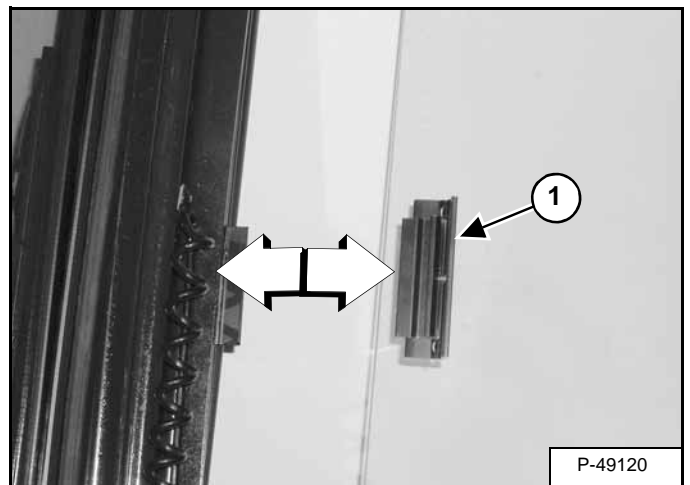
Opening the right front window

Figure 10-20-14



Pull back on the latch / handle (Item 1) [Figure 10-20-14].

Figure 10-20-15



Pull the latch / handle (Item 1) [Figure 10-20-15] back to open the window.

Closing the right front window

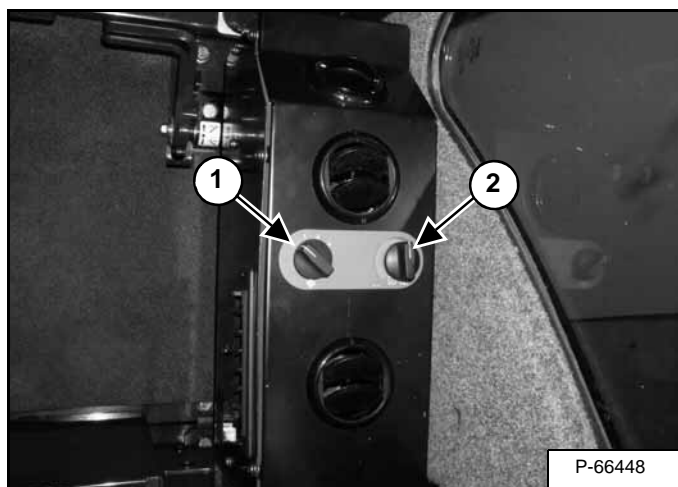
Push the handle forward to close the window.

OPERATOR CAB (ROPS / TOPS) (CONT'D)

Heater

The optional cab is equipped with a heater.

Figure 10-20-16



Fan Switch (Item 1) [Figure 10-20-16] - Turn clockwise to increase fan speed; counterclockwise to decrease. There are 4 positions; OFF - LO - MED - HI.

Temperature Control (Item 2) [Figure 10-20-16] - Turn clockwise to increase temperature; counterclockwise to decrease.

TRANSPORTING THE EXCAVATOR ON A TRAILER

Loading And Unloading

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.

Secure the parking brakes and block the wheels of the transport vehicle.

Remove the blade extensions (If equipped). (See Extension Removal And Installation on Page 30-10-1)

Retract the track frame if required.

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 with a slip resistant surface that are the correct length and width, and can support the weight of the machine.

The rear of the trailer must be blocked or supported when loading or unloading the excavator to prevent the front of the transport vehicle from raising.

Determine the direction of the track movement before moving the machine (blade forward). Engage the UPPERSTRUCTURE SLEW LOCK (See Operation on Page 10-11-1)

Figure 10-30-1



Move the machine forward onto the transport vehicle **[Figure 10-30-1]**.

Do not change direction of the machine while it is on the ramps.

Lower the boom, arm, bucket and blade to the transport vehicle.

Stop the engine and remove the key.

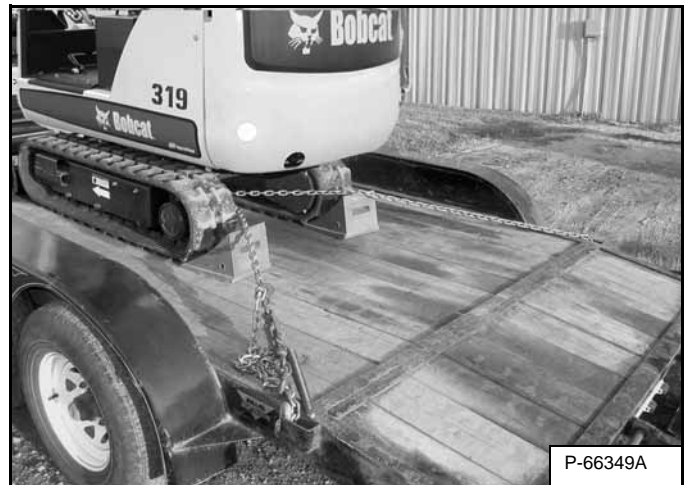
Put blocks under the front and rear of the tracks.

Fastening

Figure 10-30-2



Figure 10-30-3



Fasten chains to the front corners of the blade and to the tie down loop at the rear **[Figure 10-30-2]** & **[Figure 10-30-3]** to prevent it from moving when going up or down slopes, or during sudden stops.

Use chain binders to tighten the chains and then safely tie the chain binder levers to prevent loosening.

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

TAILGATE

Opening And Closing



AVOID INJURY OR DEATH

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

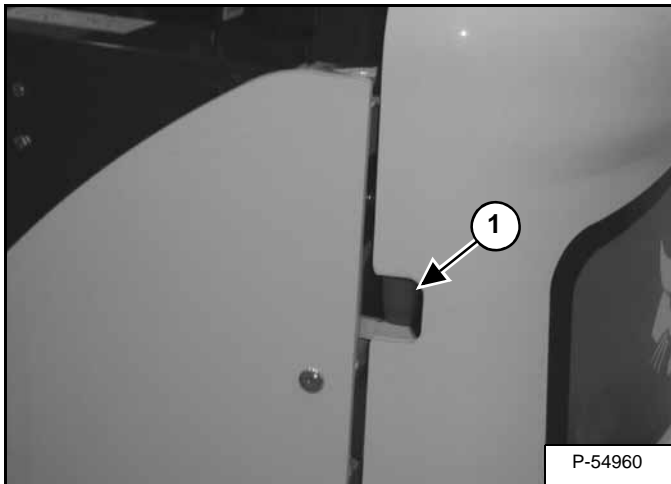
W-2012-0497



Keep the rear door closed when operating the machine. Failure to do so could seriously injure a bystander.

W-2020-1285

Figure 10-40-1



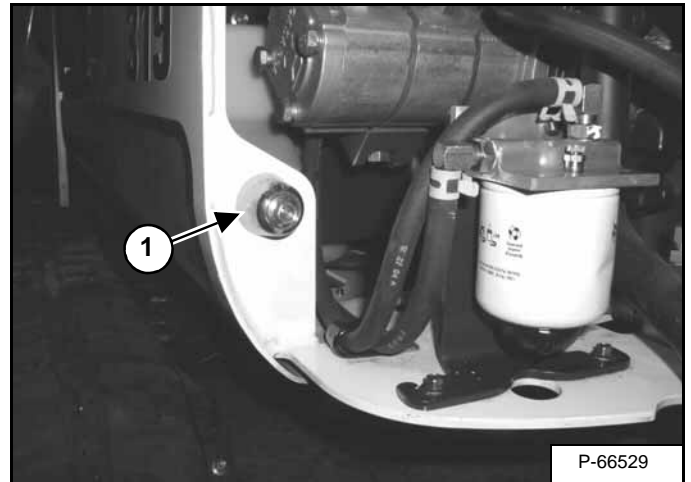
Release the latch (Item 1) [Figure 10-40-1] and pull the tailgate open.

Push firmly to close the tailgate.

NOTE: The tailgate can be locked using the start key.

Adjusting The Bumper

Figure 10-40-2

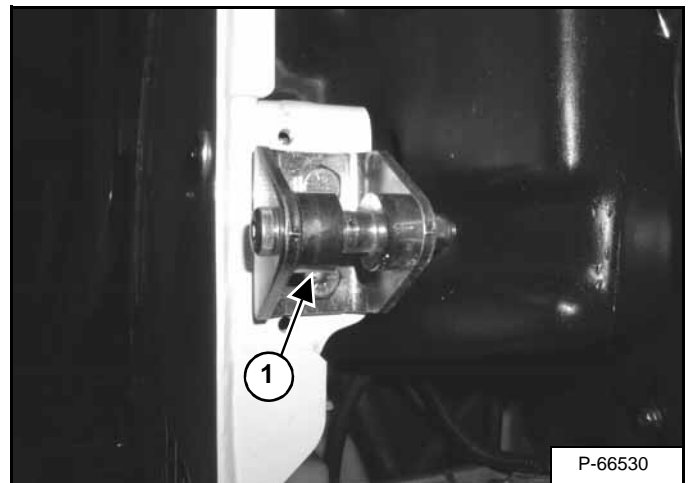


The door bumper (Item 1) [Figure 10-40-2] can be adjusted for alignment with the tailgate.

Close the tailgate before operating the excavator.

Adjusting The Latch

Figure 10-40-3



The door latch (Item 1) [Figure 10-40-3] can be adjusted by loosening the two bolts, moving the latch, and tightening the two bolts.

Close the tailgate before operating the excavator.

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.



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

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	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.						
Control Console Lockout	Check for proper function. Repair or replace as needed.						
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 (Option)	Clean the filter as needed.						
Swing Circle and Pinion	Grease 2 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.						
Alternator / Fan Belt	Check condition of belt and adjust as needed.		•				
Spark Arrestor Muffler	Clean the spark chamber.						
Fuel Filter	Replace fuel filter.						
Travel Motor	Check lubricant level in both travel motors.			••			
Engine Oil and Filter	Replace oil & filter. Use CD or better grade oil and Bobcat filter.		•				
Radiator, & Oil Cooler	Clean debris from the radiator fins.						
Hydraulic Filter	Replace the filter.			••			
Alternator & Starter	Check the alternator and starter connections.			••			
Engine Valves	Check and adjust the engine valve clearance.						
Travel Motor	Replace lubricant in both travel motors.						
Engine Cooling System	Drain and flush the cooling system. Replace premixed coolant.						
Hydraulic System	Replace the hydraulic fluid and filters. Clean the reservoir.			••			

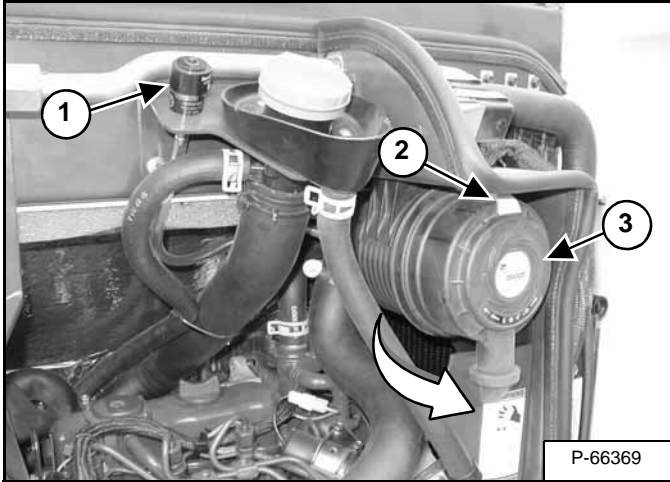
- Also at first 50 hours.
- Also at first 100 Hours.
- Or every 6 months.

AIR CLEANER SERVICE

See the SERVICE SCHEDULE for the correct service interval. (See Chart on Page 10-50-1)

Daily Check

Figure 10-60-1



Check the condition indicator (Item 1) [Figure 10-60-1]. If the red ring shows in the condition indicator, the filter needs to be replaced.

Replace the inner filter every third time the outer filter is replaced or as indicated.

Replacing Filter Elements

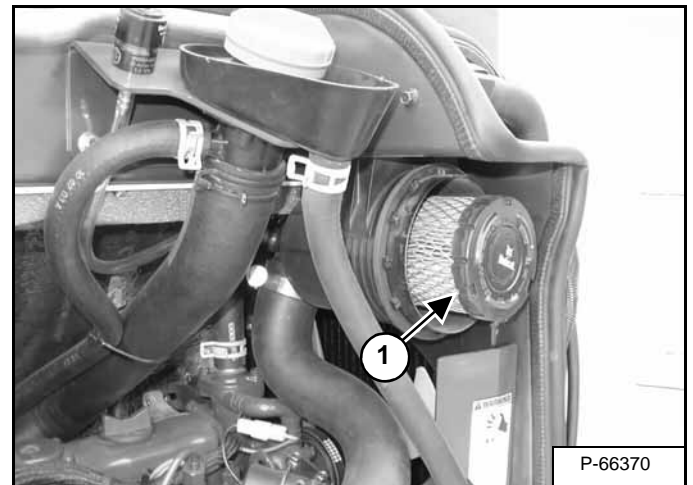
Outer Filter

Pull the locking tab (Item 2) [Figure 10-60-1].

Turn the dust cup (Item 3) [Figure 10-60-1] counter-clockwise about 1/8 turn.

Remove and clean the dust cup.

Figure 10-60-2



Pull the outer filter (Item 1) [Figure 10-60-2] from the air cleaner housing.

Check the housing for damage.

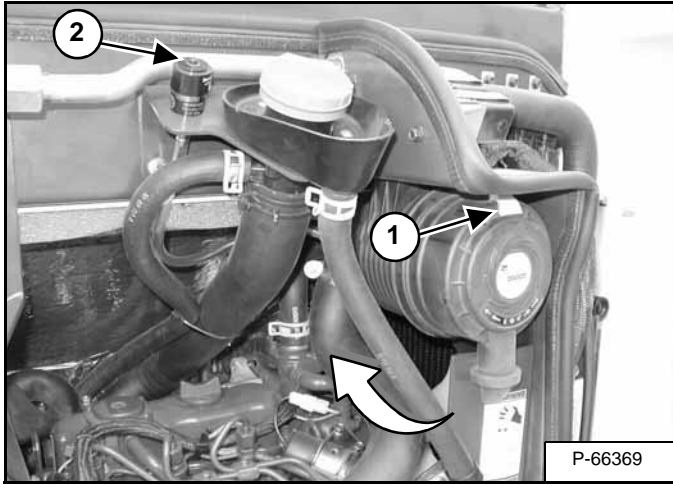
Clean the housing and the seal surface. DO NOT use compressed air.

Install a new outer filter.

AIR CLEANER (CONT'D)

Replacing Filter Elements (Cont'd)

Figure 10-60-3



Install the dust cup and turn about 1/8 turn clockwise [Figure 10-60-3].

Push locking tab in (Item 1) [Figure 10-60-3].

After the outer filter has been replaced, press the button (Item 2) [Figure 10-60-3] on the top of the condition indicator and start the engine. Run at full RPM, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.

Inner Filter

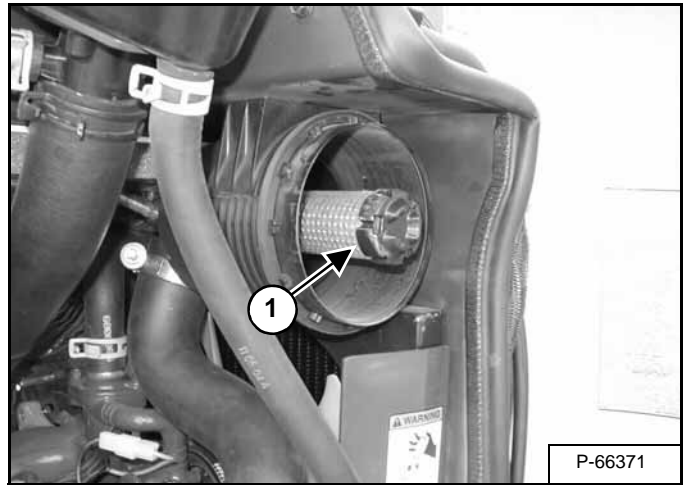
Only replace the inner filter under the following conditions:

- Replace the inner filter every *third* time the outer filter is replaced.
- After the outer filter has been replaced, press the button (Item 2) [Figure 10-60-3] on the top of the condition indicator and start the engine. Run at full RPM, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Remove the dust cup, outer filter and inner filter.

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

Figure 10-60-4



Install the new inner filter (Item 1) [Figure 10-60-4].

Install the outer filter and the dust cup.

Press the button on the condition indicator to reset the condition indicator by remove the red ring.

ENGINE COOLING SYSTEM

Check the cooling system every day to prevent overheating, loss of performance or engine damage.

Cleaning

Open the tailgate.

Use air pressure or water pressure to clean the radiator and oil cooler.

Checking Level



AVOID BURNS

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

W-2070-1203

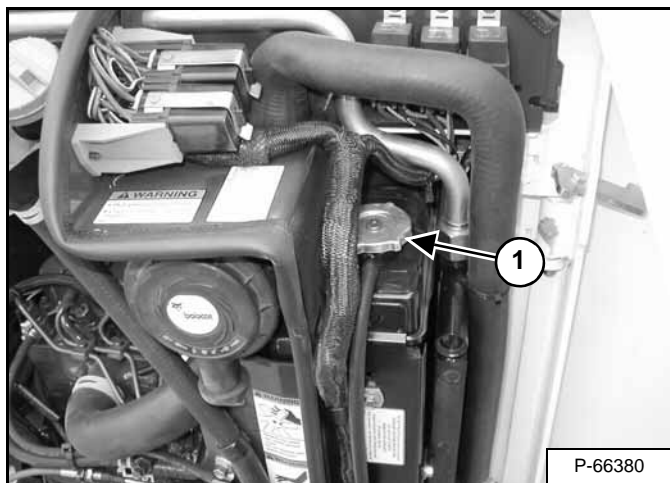


Wear safety glasses to prevent eye injury when any of the following conditions exist:

- When fluids are under pressure.
- Flying debris or loose material is present.
- Engine is running.
- Tools are being used.

W-2019-1285

Figure 10-70-1



When the engine is cool, remove the radiator cap (Item 1) [Figure 10-70-1].

The coolant level must be 0.750 to 1.0 in. (20 to 25 mm) below the filler neck.

If the coolant level is low, add premixed coolant to the radiator.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

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

ENGINE COOLING SYSTEM (CONT'D)

Removing And Replacing Coolant

See the SERVICE SCHEDULE for correct service intervals. (See Chart on Page 10-50-1)

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



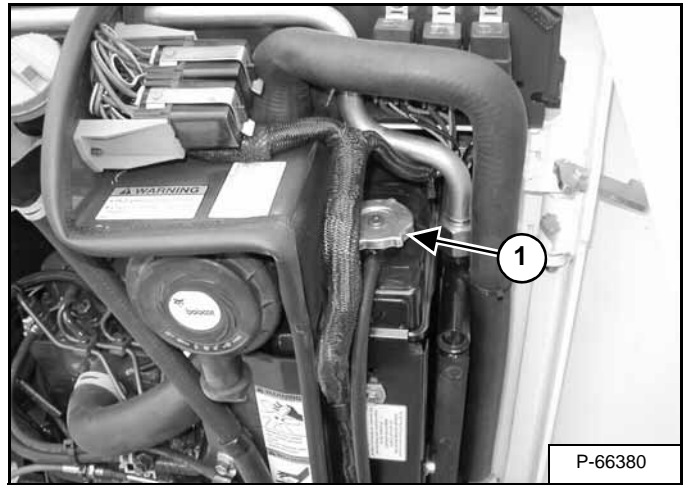
WARNING

AVOID BURNS

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

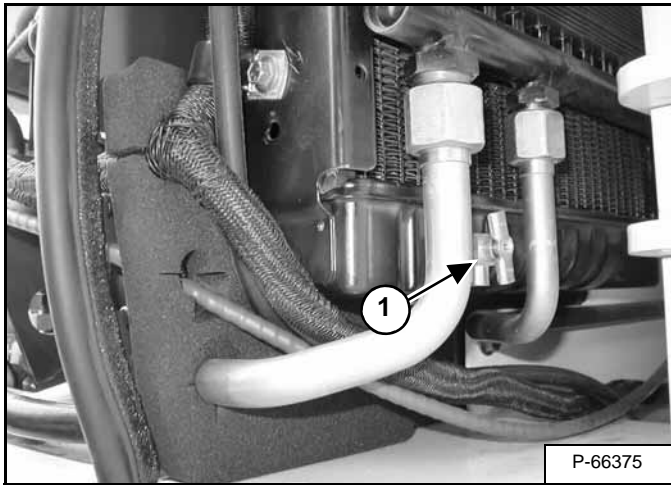
W-2070-1203

Figure 10-70-2



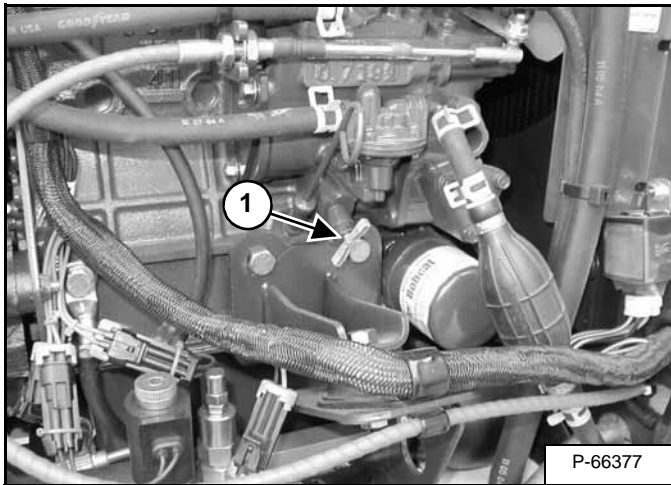
When the engine is cool, loosen and remove the radiator cap (Item 1) [Figure 10-70-2].

Figure 10-70-3



Open the drain valve (Item 1) [Figure 10-70-3] at the bottom of the radiator and drain the coolant into a container.

Figure 10-70-4



Open the drain valve (Item 1) [Figure 10-70-4] on the engine block and drain the coolant into a container.

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

Recycle or dispose of the used coolant in an environmentally safe manner.

ENGINE COOLING SYSTEM (CONT'D)

Removing And Replacing Coolant (Cont'd)

Mix the coolant in a separate container.

NOTE: The cooling system is factory filled with propylene glycol (purple color). **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.

1 gallon and 1 pint of propylene glycol mixed with 1 gallon of water is the correct mixture of coolant to provide a -34°F (-37°C) freeze protection.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

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

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

Add premixed coolant until the level is correct.

Run the engine until it is at operating temperature. Stop the engine. Check the coolant level and add as needed. Install the radiator cap and tighten.

Add coolant to the recovery tank as needed.

Close the tailgate.

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.

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

Contact your fuel supplier for local recommendations.

WARNING

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

W-2063-0887

WARNING

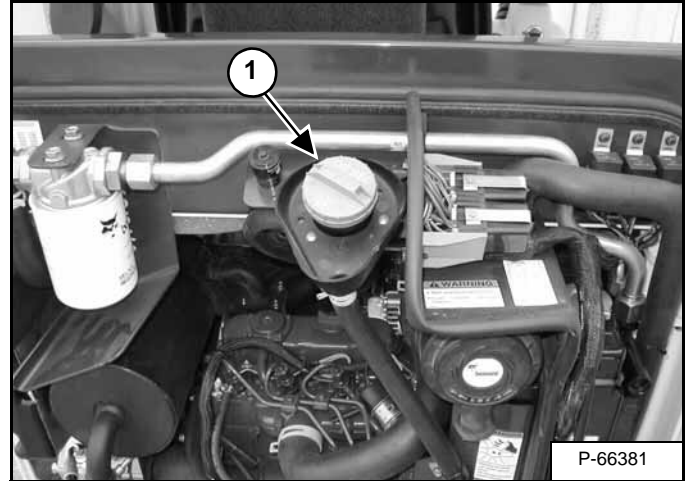
Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285

Filling The Fuel Tank

Open the tailgate.

Figure 10-80-1



Remove the fuel fill cap (Item 1) [Figure 10-80-1].

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. Close the tailgate.

See the SERVICE SCHEDULE for the service interval when to remove water from or replace the fuel filter. (See Chart on Page 10-50-1)

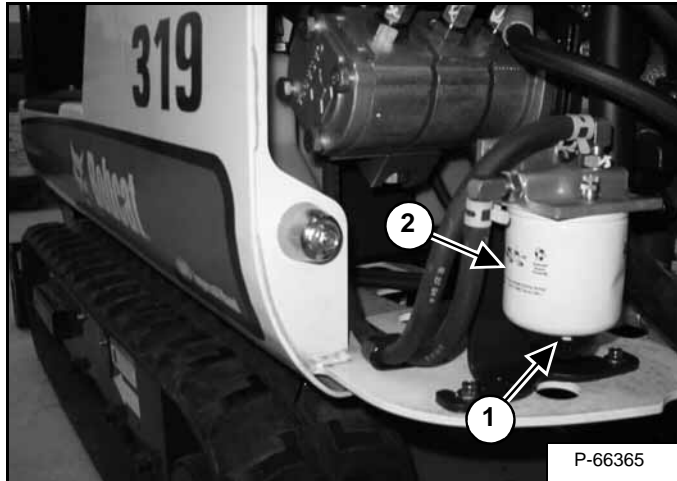
FUEL SYSTEM (CONT'D)

Fuel Filters

Removing Water

Open the tailgate.

Figure 10-80-2



Loosen the drain (Item 1) [Figure 10-80-2] at the bottom of the filter to drain water from the filter.

Replacing Elements

Remove the filter (Item 2) [Figure 10-80-2].

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

Remove the air from the fuel system. (See Removing Air From The Fuel System on Page 10-80-3)

Draining The Fuel Tank

See the SERVICE SCHEDULE for the correct service interval. (See Chart on Page 10-50-1)

Turn the upperstructure until the fuel tank drain is centered between the rear tracks.

Figure 10-80-3

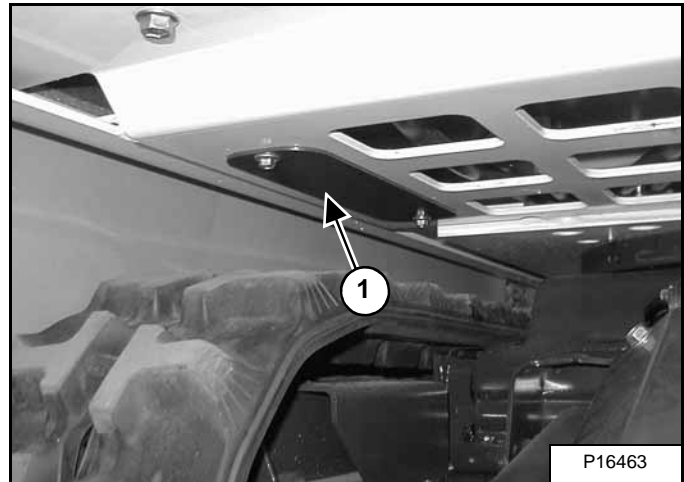
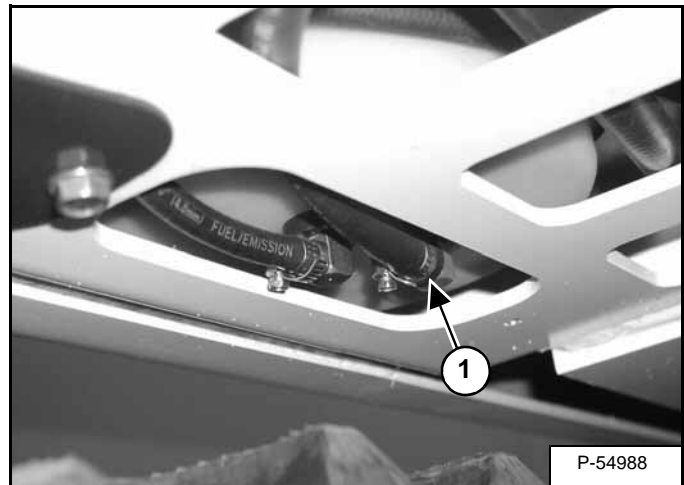


Figure 10-80-4



Remove the access panel (Item 1) [Figure 10-80-3] on the bottom of the engine compartment. Loosen the clamp (Item 1) [Figure 10-80-4] and disconnect the fuel hose.

Drain the fuel into a container.

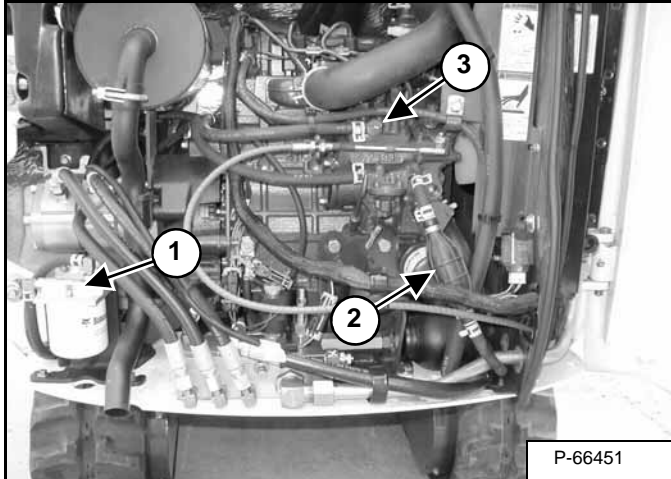
Reuse, recycle or dispose of fuel in an environmentally safe manner.

FUEL SYSTEM (CONT'D)

Removing Air From The Fuel System

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

Figure 10-80-5



Open the fuel filter vent (Item 1) [Figure 10-80-5].

Operate the hand pump (priming bulb) (Item 2) [Figure 10-80-5] until the fuel flows from the vent with no air bubbles.

Close the vent (Item 1) [Figure 10-80-5] on the fuel filter housing.

Start the engine. It may be necessary to open the vent (Item 3) [Figure 10-80-5] (at the fuel injection pump) briefly until the engine runs smoothly.

WARNING

Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

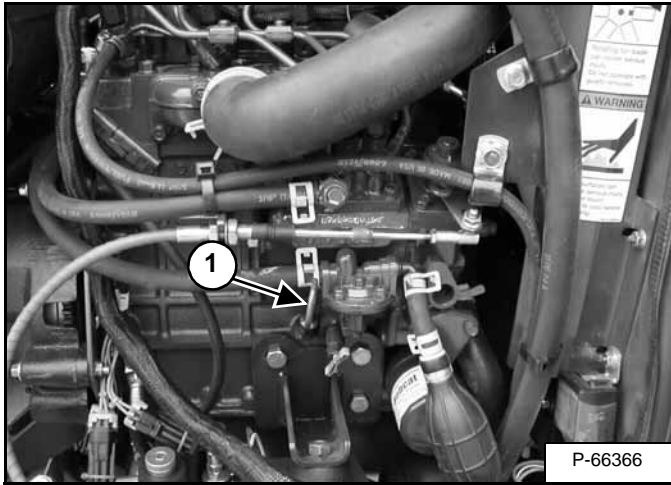
W-2072-0496

ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

Check the engine oil every day before starting the engine for the work shift.

Figure 10-90-1

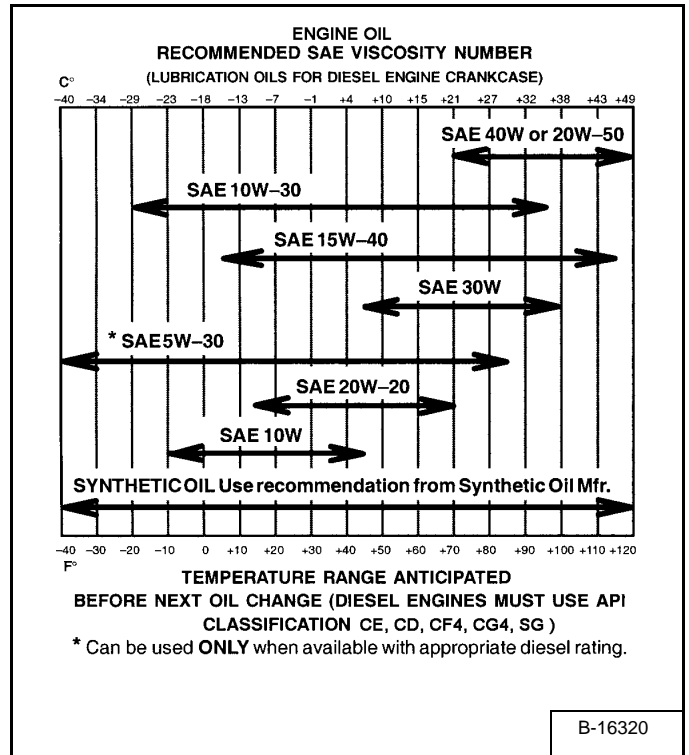


Open the tailgate and remove the dipstick (Item 1) [Figure 10-90-1].

Keep the oil level between the marks on the dipstick.

Engine Oil Chart

Figure 10-90-2



Use a good quality motor oil that meets the correct API Service Classification [Figure 10-90-2].

Install the dipstick and close the tailgate.

ENGINE LUBRICATION SYSTEM (CONT'D)

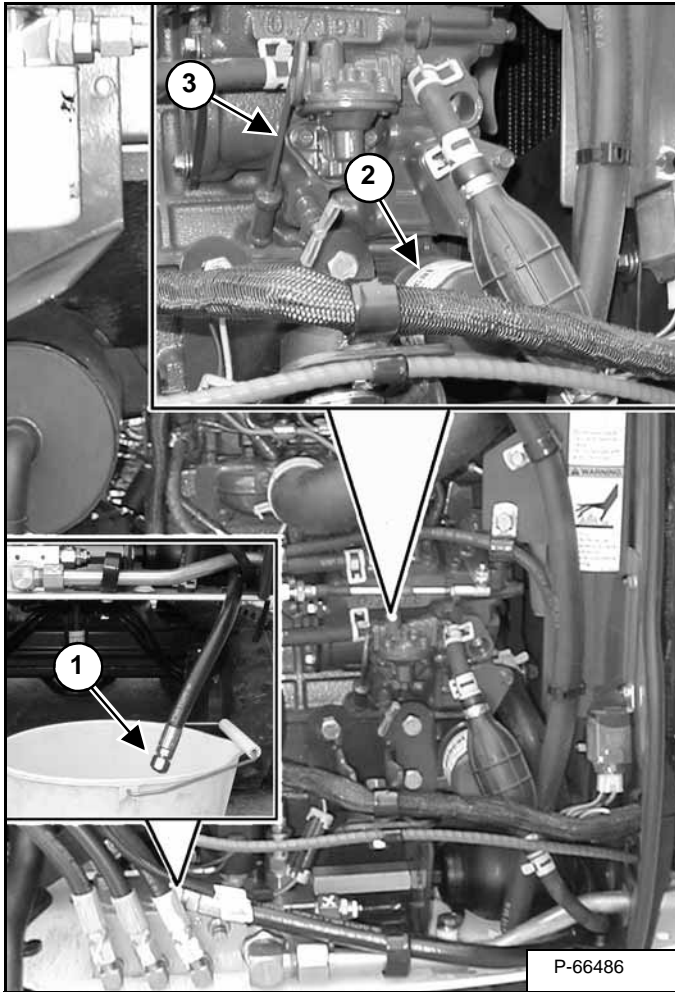
Removing And Replacing Oil And Filter

See the Service Schedule for the service interval for replacing the engine oil and filter. (See Chart on Page 10-50-1.)

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

Open the tailgate.

Figure 10-90-3



Remove the engine oil drain plug (Item 1) [Figure 10-90-3]. Drain the oil into a container and recycle or dispose of used oil in an environmentally safe manner.

Remove the oil filter (Item 2) [Figure 10-90-3] and clean the filter housing surface.

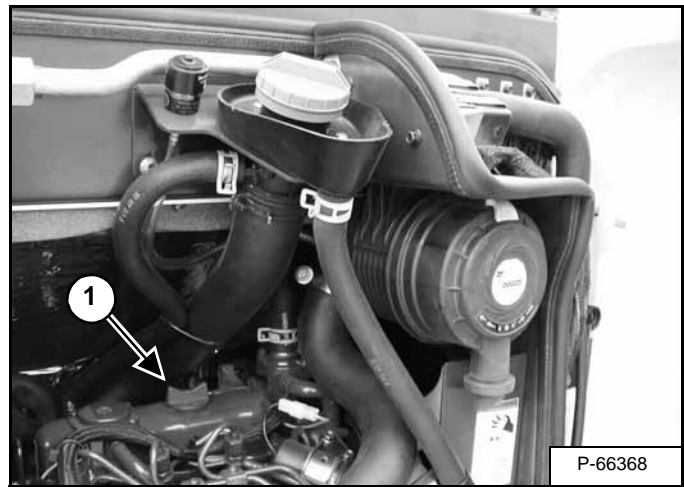
Use a genuine Bobcat filter.

Put clean oil on the filter gasket.

Install the filter and hand tighten.

Install and tighten the oil drain plug.

Figure 10-90-4



Remove the fill cap (Item 1) [Figure 10-90-4].

Put in 3.75 qt. (3,5 L) of oil into the engine.

Use a good quality motor oil that meets the correct API Service Classification [Figure 10-90-2].

Install the fill cap.

Start the engine and let it run for several minutes.

Stop the engine. Check for leaks at the oil filter. Check the oil level.

Add oil as needed if it is not at the top mark on the dipstick (Item 3) [Figure 10-90-3].

HYDRAULIC SYSTEM

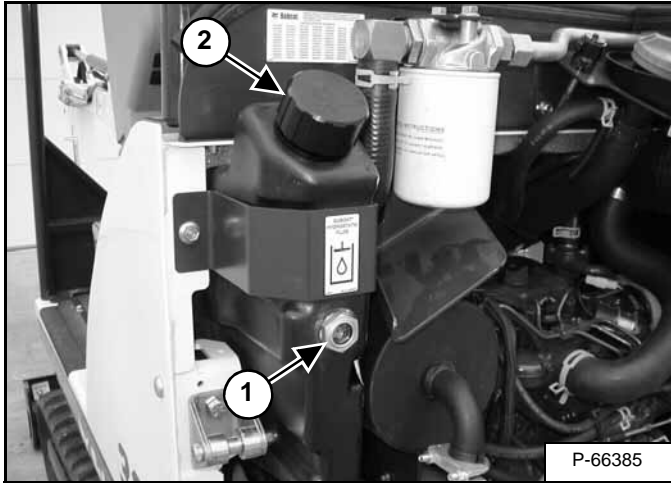
Checking And Adding Fluid

Put the machine on a level surface.

Retract the tracks fully.

Retract the arm and bucket cylinders. Lower the bucket to the ground and lower the blade. Stop the engine.

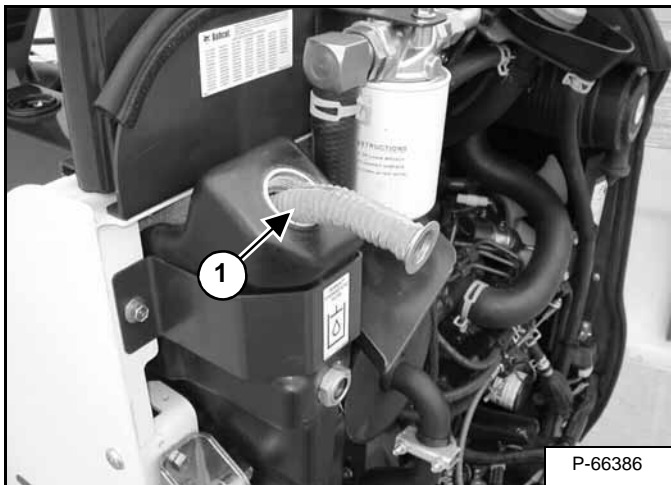
Figure 10-100-1



Open the tailgate. The fluid must be at the center of the sight gauge (Item 1) [Figure 10-100-1].

Remove oil fill cap (Item 2) [Figure 10-100-1].

Figure 10-100-2



Check the condition of the screen (Item 1) [Figure 10-100-2] in the fill neck of the reservoir. The screen must be installed in fill neck when adding oil.

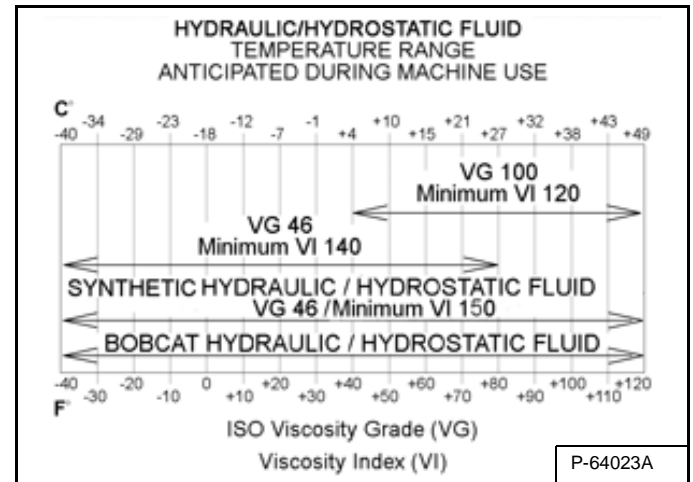
WARNING

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

Hydraulic Fluid Chart

Figure 10-100-3



Use the correct hydraulic fluid shown in chart [Figure 10-100-3].

Add hydraulic fluid as needed to bring the level to the center of sight gauge (Item 1) [Figure 10-100-1].

Install the oil fill cap.

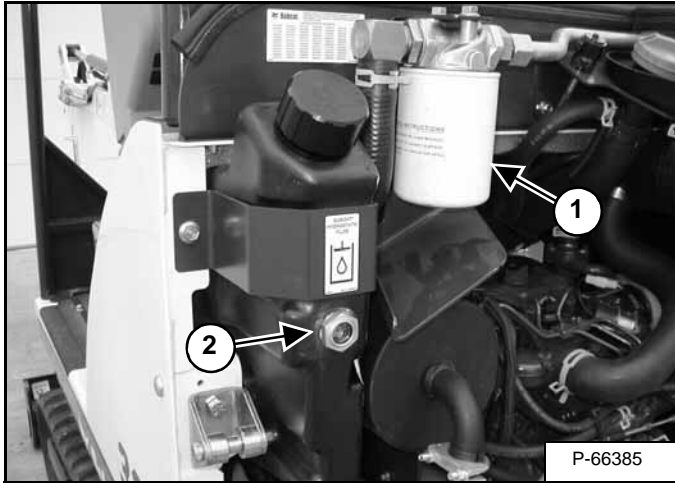
HYDRAULIC SYSTEM (CONT'D)

Removing And Replacing Hydraulic Filter

See the Service Schedule for the correct service interval. (See Chart on Page 10-50-1.)

Open the tailgate.

Figure 10-100-4



Remove the filter (Item 1) [Figure 10-100-4].

Clean the housing where the filter gasket makes contact.

Put clean hydraulic fluid on the gasket. Install the new filter and hand tighten only.

Start the engine. Run the excavator through the hydraulic functions. Stop the engine. Check the fluid level at the sight gauge (Item 2) [Figure 10-100-4] and add as needed. Check the filter area for leaks.

Removing And Replacing Hydraulic Fluid

See the Service Schedule for the correct service interval. (See Chart on Page 10-50-1.)

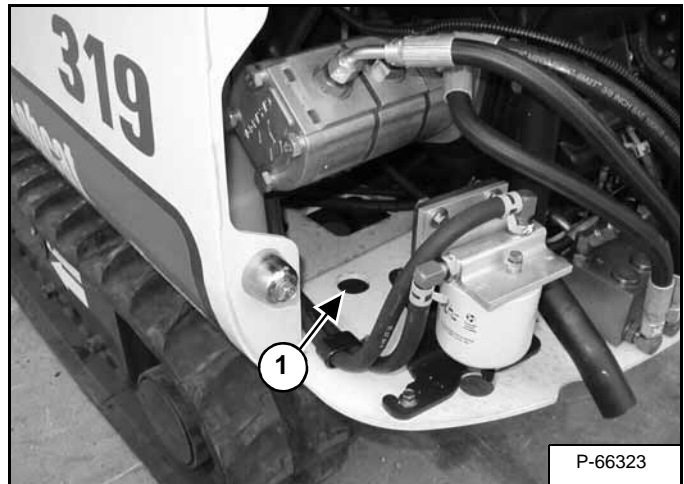
Retract the tracks fully.

Retract the arm and bucket cylinders. Lower the bucket to the ground and lower the blade. Stop the engine.

Open the tailgate.

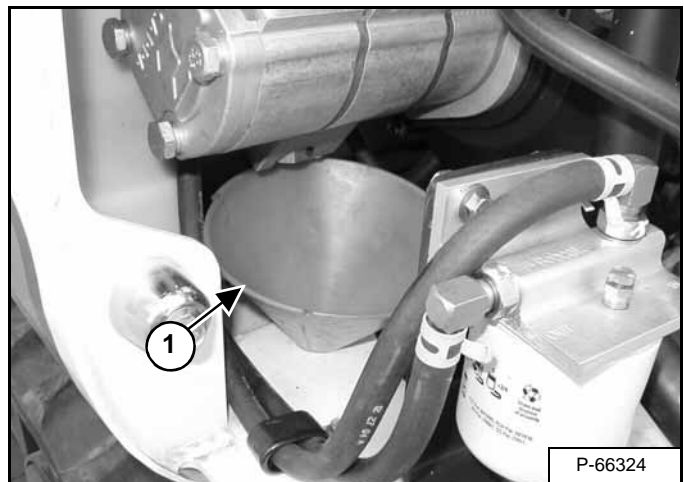
Remove and replace the hydraulic filter.

Figure 10-100-5



A hole (Item 1) [Figure 10-100-5] is provided in the housing for ease of draining the hydraulic fluid.

Figure 10-100-6



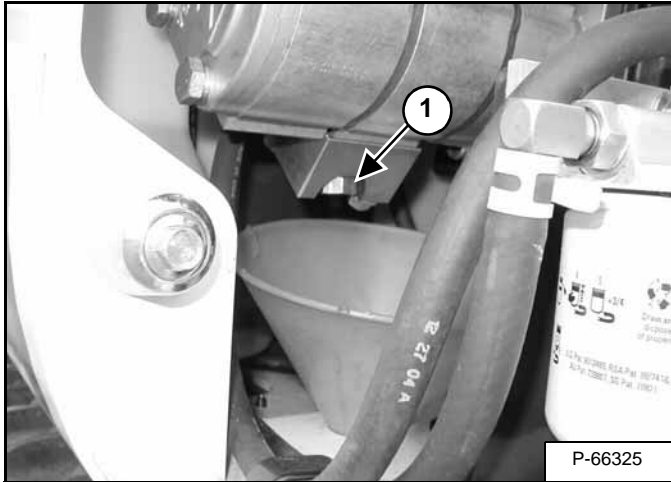
Install a funnel (Item 1) [Figure 10-100-6] in the hole.

Place a container under the funnel.

HYDRAULIC SYSTEM (CONT'D)

Removing And Replacing Hydraulic Fluid (Cont'd)

Figure 10-100-7



Remove the drain plug (Item 1) [Figure 10-100-7] from the pump fitting and drain the hydraulic fluid into the container.

IMPORTANT

Fluid such as engine oil, hydraulic fluid, coolants, grease, 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 the correct disposal.

I-2067-0499

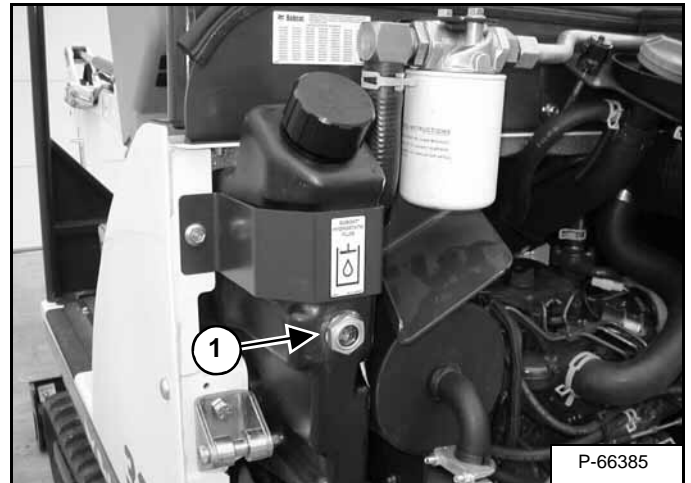
IMPORTANT

If the fluid is being drained because of a system failure, remove and clean all hydraulic lines.

I-2045-0788

Install the drain plug.

Figure 10-100-8



Add fluid to the reservoir until it is at the center of the sight gauge (Item 1) [Figure 10-100-8]. (See Checking And Adding Fluid on Page 10-100-1.)

Run the excavator through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.

LUBRICATING THE EXCAVATOR

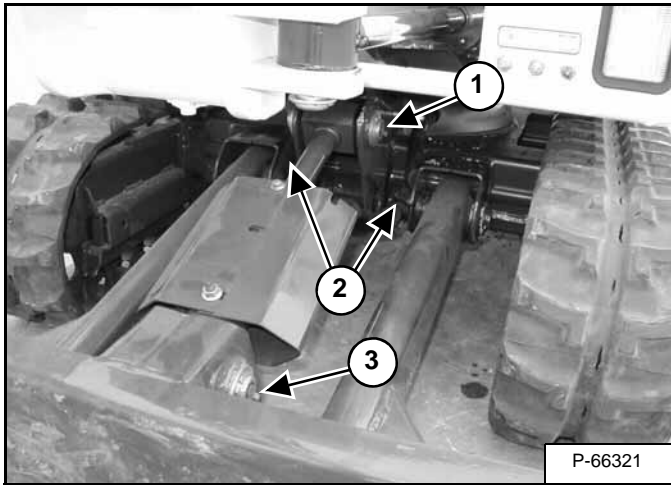
Lubrication Locations

Lubricate the excavator as specified in the SERVICE SCHEDULE for the best performance of the machine. (See Chart on Page 10-50-1)

Record the operating hours each time you lubricate the excavator.

Always use a good quality lithium based multi-purpose grease when lubricating the excavator. Apply the lubricant until extra grease shows.

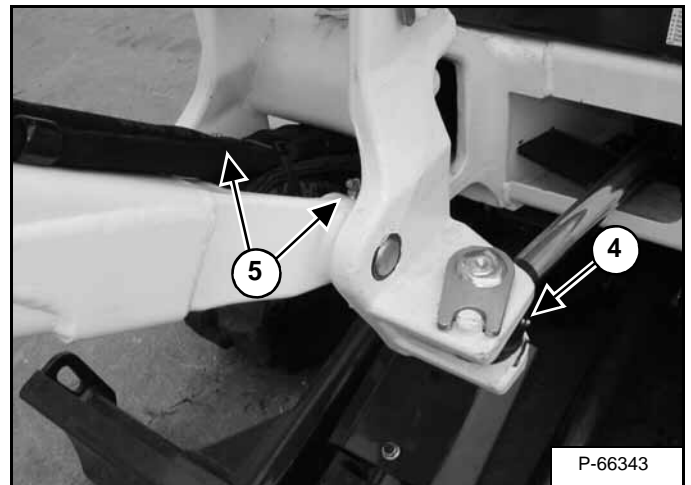
Figure 10-110-1



Ref Description (# of Fittings)

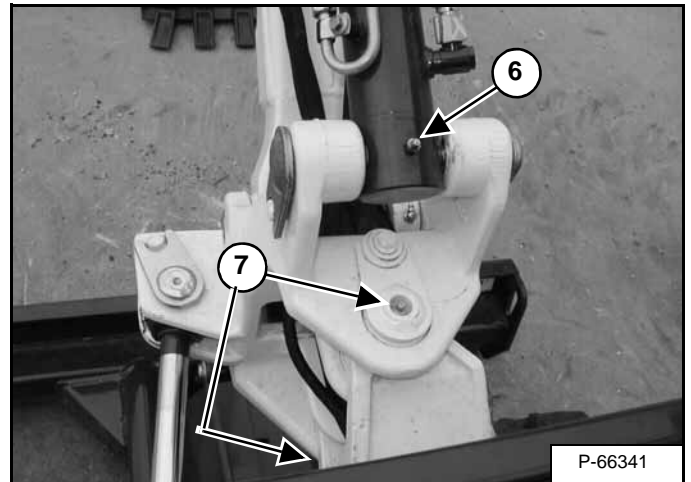
1. Blade Cylinder-Rod End, every 8 to 10 hours (1) [Figure 10-110-1]
2. Blade Pivots, every 8 to 10 hours (2) [Figure 10-110-1]
3. Blade Cylinder-Base End, every 8 to 10 hours (1) [Figure 10-110-1]

Figure 10-110-2



4. Boom Swing Cylinder-Rod End, every 8 to 10 hours (1) [Figure 10-110-2]
5. Boom Base End, every 8 to 10 hours (2) [Figure 10-110-2]

Figure 10-110-3

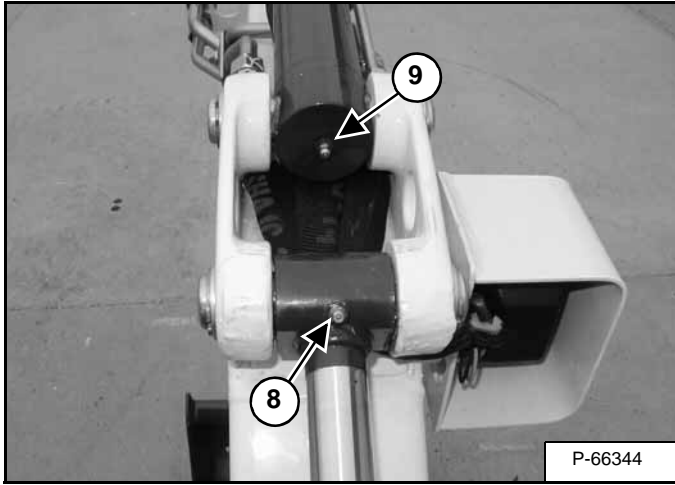


6. Boom Cylinder - Base End, every 8 to 10 hours (1) [Figure 10-110-3]
7. Boom Swing Pivot, every 8 to 10 hours (2 - on top and bottom swing pin) [Figure 10-110-3]

LUBRICATING THE EXCAVATOR (CONT'D)

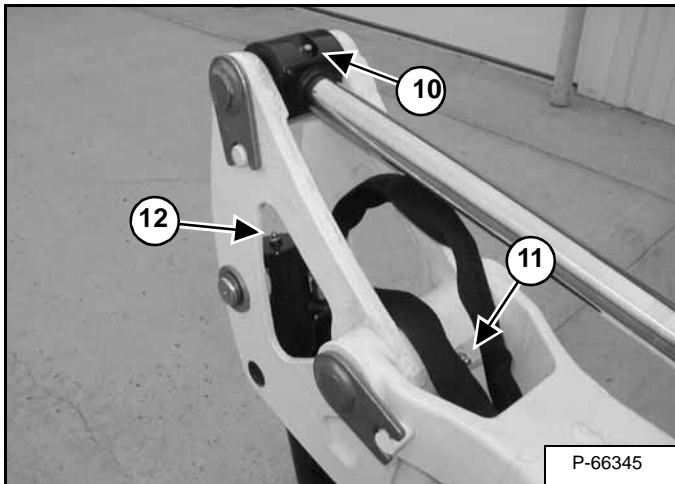
Lubrication Locations (Cont'd)

Figure 10-110-4



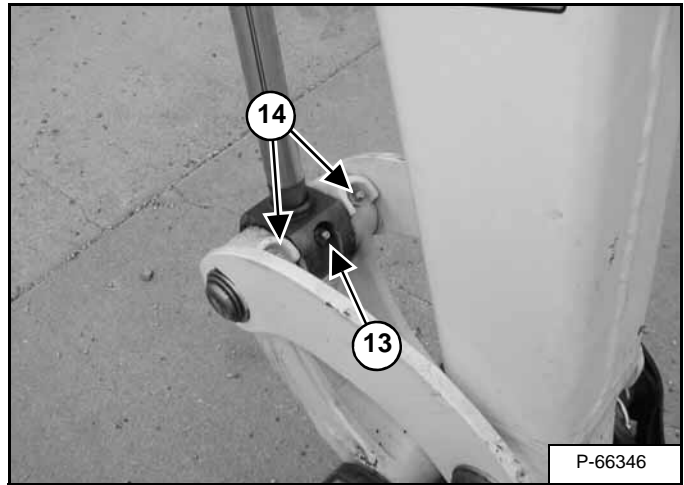
- 8. Boom Cylinder - Rod End, every 8 to 10 hours (1) [Figure 10-110-4]
- 9. Arm Cylinder - Base End, every 8 to 10 hours (1) [Figure 10-110-4]

Figure 10-110-5



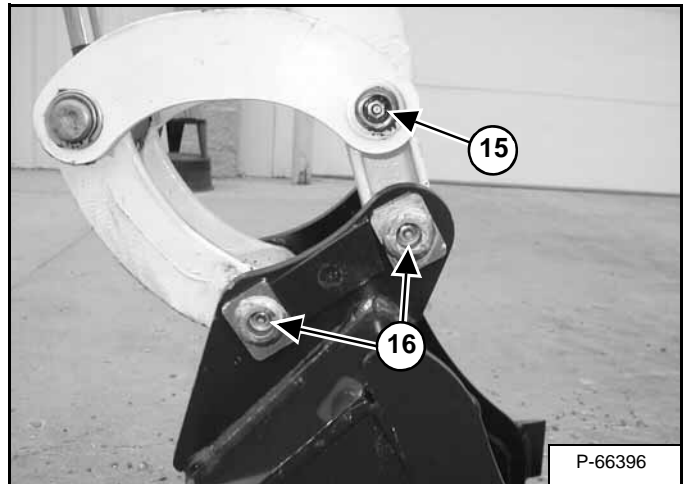
- 10. Arm Cylinder - Rod End, every 8 to 10 hours (1) [Figure 10-110-5]
- 11. Arm Pivot, every 8 to 10 hours (1) [Figure 10-110-5]
- 12. Bucket Cylinder - Base End, every 8 to 10 hours (1) [Figure 10-110-5]

Figure 10-110-6



- 13. Bucket Cylinder - Rod End, every 8 to 10 hours (1) [Figure 10-110-6]
- 14. Bucket Link Pivots, every 8 to 10 hours (2) [Figure 10-110-6]

Figure 10-110-7

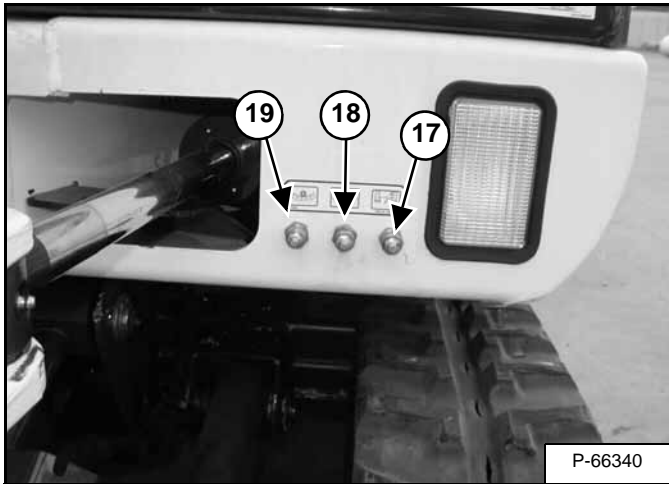


- 15. Bucket Link Pivot, every 8 to 10 hours (1) [Figure 10-110-7]
- 16. Bucket Pivots, every 8 to 10 hours (2) [Figure 10-110-7]

LUBRICATING THE EXCAVATOR (CONT'D)

Lubrication Locations (Cont'd)

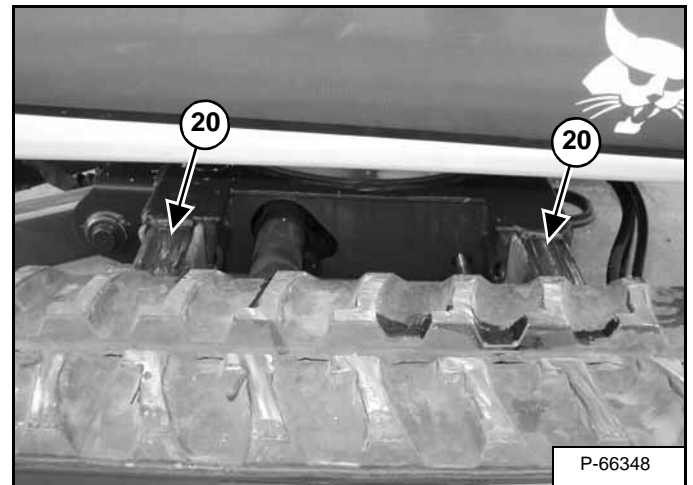
Figure 10-110-8



- 17. Boom Swing Cylinder-Base End every 8 to 10 hours [Figure 10-110-8]
- 18. Swing Circle Bearing, every 50 hours [Figure 10-110-8]
- 19. Swing Circle Pinion, every 50 hours. Pump 4 times with a grease gun. Rotate the upperstructure 180° and repeat. [Figure 10-110-8]

NOTE: Do not over-grease the swing circle; damage to the seal could result. Pump 4 to 5 times with a grease gun. Rotate the upperstructure 90° and repeat 3 more times.

Figure 10-110-9



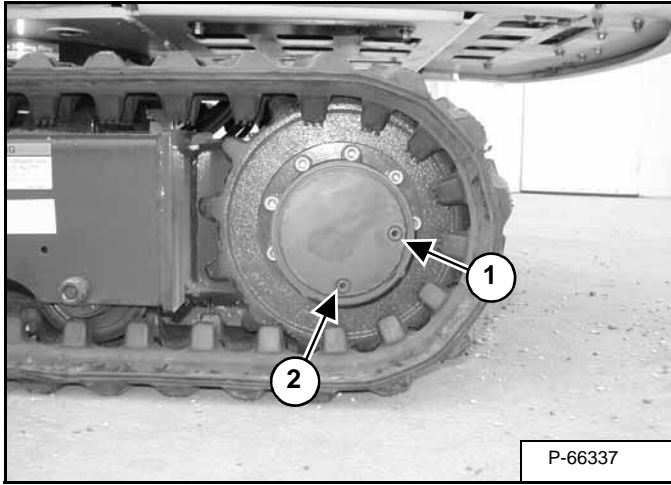
- 20. Track Expansion Tube, as required [Figure 10-110-9].

NOTE: Spread lubriplate gearshield extra heavy grease evenly on wear surfaces on both sides of excavator as required.

TRAVEL MOTOR

Checking And Adding Oil

Figure 10-120-1



Put the machine on a level surface with the plugs positioned as shown (Items 1 & 2) **[Figure 10-120-1]**.

Remove the plug (Item 1) **[Figure 10-120-1]**. The oil level should be at the bottom edge of the plug hole.

Add SAE-90W gear lube through the hole if the oil level is below the hole (each motor).

Install and tighten both plugs.

Repeat the procedure for the other side.

Removing And Replacing Oil

See the SERVICE SCHEDULE for the correct service interval. (See Chart on Page 10-50-1)

Put the machine on a level surface with the plugs positioned as shown (Items 1 & 2) **[Figure 10-120-1]**.

Remove the bottom plug (Item 2) and top plug (Item 1) **[Figure 10-120-1]** and drain into a container. Recycle or dispose of the used lubricant in an environmentally safe manner.

After all the gear lube is removed, install plug (Item 2) **[Figure 10-120-1]**.

Add 0.53 qt. (0,5 L) of SAE-90W gear lube to the plug hole (Item 1) **[Figure 10-120-1]** until the gear lube level is at the bottom edge of the plug hole (each motor).

Install and tighten the plug.

Repeat the procedure for the other side.

SPARK ARRESTOR MUFFLER

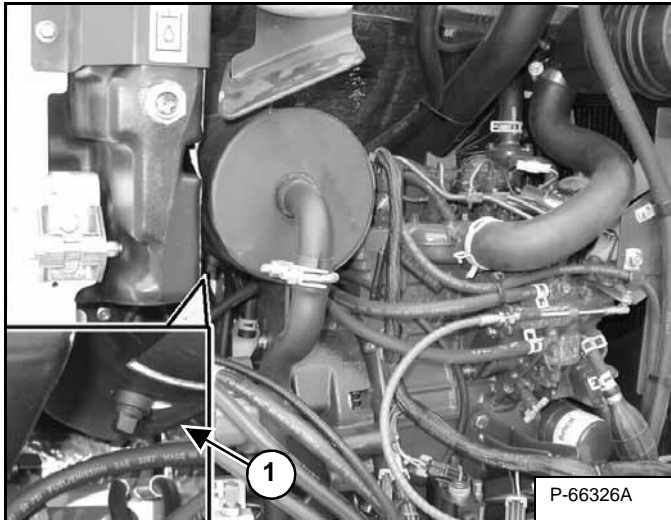
Cleaning Procedure

See the SERVICE SCHEDULE for the correct service interval. (See Chart on Page 10-50-1.)

Do not operate the excavator with a defective exhaust system.

Stop the engine. Open the tailgate.

Figure 10-130-1



Remove the plug (Item 1) [Figure 10-130-1] from the bottom of the muffler.

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 cleanout hole.)

Stop the engine. Install and tighten the plug.

Close the tailgate.

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

WARNING

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

W-2011-1285

WARNING

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

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

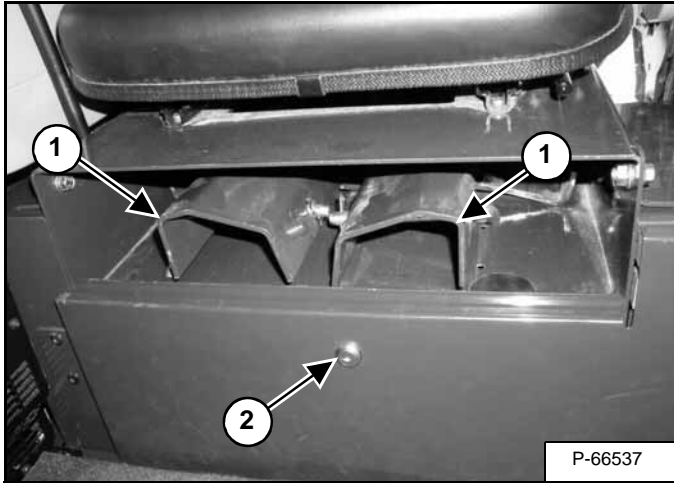
ALTERNATOR BELT

Belt Adjustment

Replace the belt if it has stretched or there are cracks in the belt. Replace the pulley if the belt contacts the bottom of the groove in the pulley.

Stop the engine.

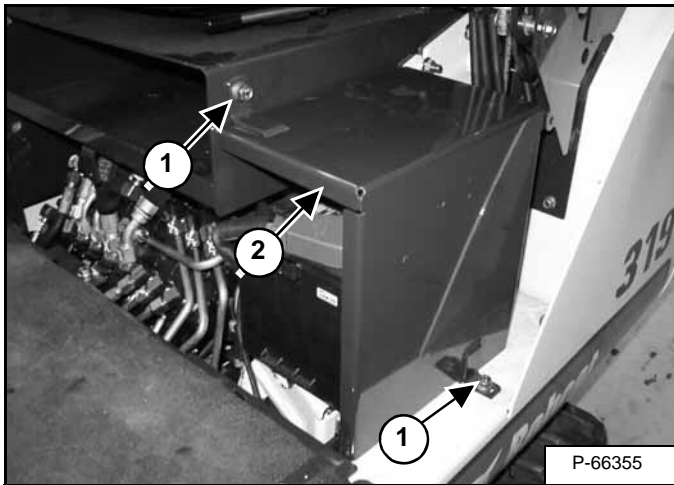
Figure 10-140-1



Remove the two blade extensions (Item 1) [Figure 10-140-1] from the storage compartment.

Use the start key to remove the access cover (Item 2) [Figure 10-140-1].

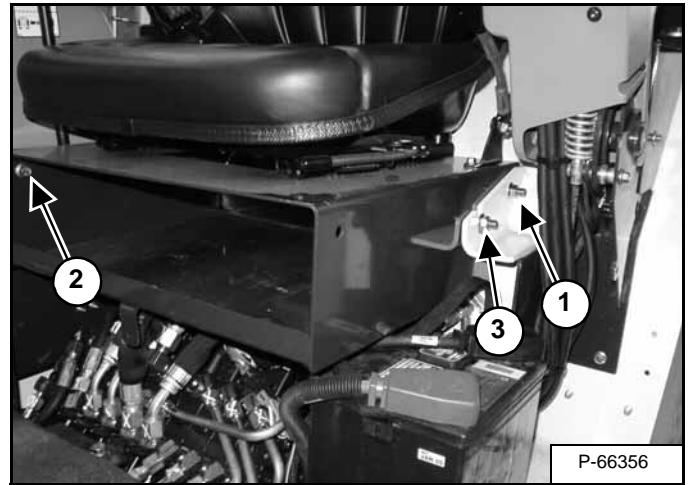
Figure 10-140-2



Remove the two bolts (Item 1) [Figure 10-140-2] and brackets from the battery cover.

Remove the cover (Item 2) [Figure 10-140-2].

Figure 10-140-3



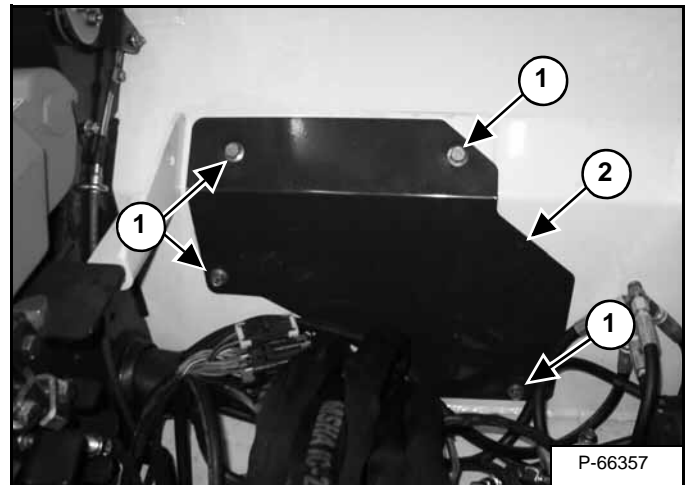
Remove the two bolts (Item 1) [Figure 10-140-3] and nuts from both sides of the seat mount.

Remove the bolt (Item 2) [Figure 10-140-3], nut and bracket from the right side of the seat mount.

Loosen the two bolts (Item 3) [Figure 10-140-3] and nuts from both sides of the seat mount.

Remove the seat and seat mount.

Figure 10-140-4

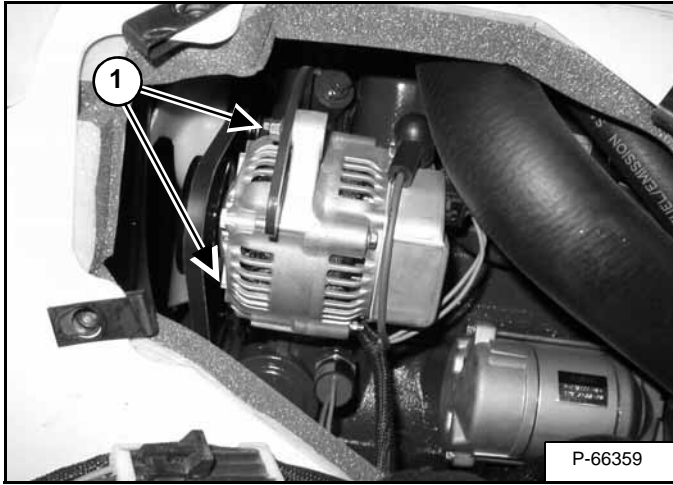


Remove the four bolts (Item 1) and remove the access panel (Item 2) [Figure 10-140-4].

ALTERNATOR BELT (CONT'D)

Belt Adjustment (Cont'd)

Figure 10-140-5



Loosen the alternator mounting and adjustment bolts (Item 1) [Figure 10-140-5].

If a belt tension tool is available, move the alternator toward the front of the machine [Figure 10-140-5] until the belt has (New belt = 56 to 60 lbf. or Used belt = 48 to 52 lbf.) tension.

If a belt tension tool is not available, move the alternator toward the front of the machine [Figure 10-140-5] until the belt has 0.50 in. (13 mm) movement at the middle of the belt span with 13 lb. (58 N) of force.

Tighten the mounting and adjustment bolts.

Install the access panel, the seat and seat mount, the battery cover, the access cover and the 2 blade extensions.

Belt Replacement

See Belt Adjustment for removal of components to access the alternator belt. (See Belt Adjustment on Page 10-140-1).

Loosen the alternator mounting and adjustment bolts (Item 1) [Figure 10-140-5] and loosen the belt all the way.

Remove the belt and install a new belt.

Adjust the belt as shown above.

SEAT BELT

Inspection And Maintenance

WARNING

Failure to properly inspect and maintain the seat belt can cause lack of operator restraint resulting in serious injury or death.

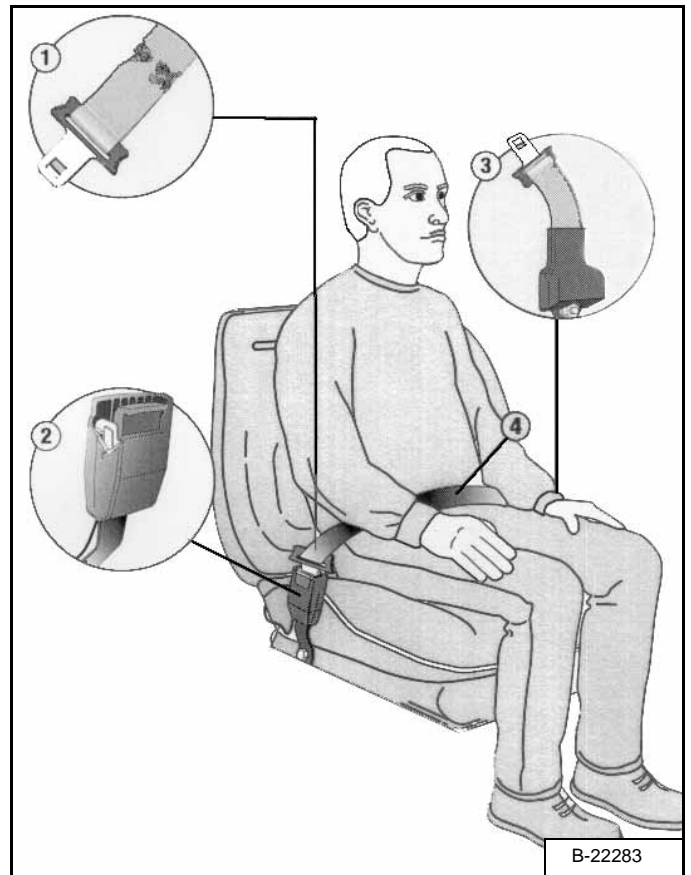
W-2466-0703

Check the seat belt daily for correct function.

Inspect the seat belt system thoroughly yearly or more often if the machine is exposed to severe environmental conditions or applications.

The seat belt system should be repaired or replaced if it shows cuts, fraying, extreme or unusual wear, significant discolorations due to ultraviolet (UV) rays from the sun, dusty/dirty conditions, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor (if equipped), or hardware.

Figure 10-150-1



The items below are referenced in [Figure 10-150-1].

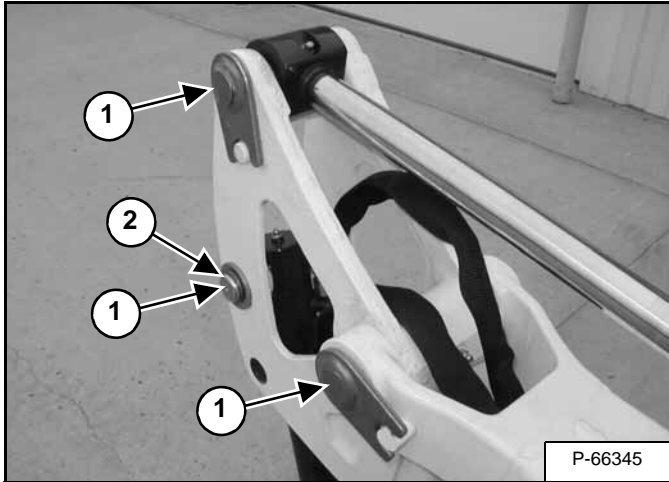
1. Check the seat belt webbing. If the system is equipped with a retractor, pull the webbing completely out and inspect the full length of the webbing. Look for cuts, wear, fraying, dirt and stiffness.
2. Check the buckle and latch for proper function. Make sure latch plate is not excessively worn, deformed or buckle is not damaged.
3. Check the retractor web storage device (if equipped) by extending the seat belt webbing to determine if it extends and retracts the webbing correctly.
4. Check webbing in areas exposed to ultraviolet (UV) rays from the sun or extreme dust or dirt. If the original color of the webbing in these areas is extremely faded and / or the webbing is packed with dirt, the webbing strength may have weakened.

See your Bobcat dealer for approved seat belt system replacement parts for your machine.

PIVOT PINS

Inspection And Maintenance

Figure 10-160-1



The boom, arm and cylinders pivots (Item 1) have a large pin held in position with a snap ring (Item 2) [Figure 10-160-1].

Check that the snap rings are securely inserted into the grooves on the pins and that the snap rings are not damaged. See your Bobcat dealer for replacement parts.

EXCAVATOR STORAGE AND RETURN TO SERVICE

Storage

Sometimes it may be necessary to store your Bobcat Excavator for an extended period of time. Below is a list of items to perform before storage.

- Thoroughly clean the excavator including the engine compartment.
- Lubricate the excavator.
- Replace worn or damaged parts.
- Drive the excavator onto planks in a dry protected shelter.
- Lower the boom fully with the bucket flat on the ground.
- Put grease on any exposed cylinder rods.
- Put fuel stabilizer in the fuel tank and run the engine a few minutes to circulate the stabilizer to the pump and fuel injectors.
- Drain and flush the cooling system. Refill with premixed coolant.
- Replace all fluids and filters (engine, hydraulic).
- Replace all filters (i.e.: air cleaner, heater, etc.).
- Put all controls in neutral position.
- Remove the battery. Be sure the electrolyte level is correct then charge the battery. Store it in a cool dry place above freezing temperatures and charge it periodically during storage.
- Cover the exhaust pipe opening.
- Tag the machine to indicate that it is in storage condition.

Return to Service

After the Bobcat Excavator has been in storage, it is necessary to follow a list of items to return the excavator to service.

- Check the engine and hydraulic oil levels; check coolant level.
- Install a fully charged battery.
- Remove grease from exposed cylinder rods.
- Check all belt tensions.
- Be sure all shields and guards are in place.
- Lubricate the excavator.
- Remove cover from exhaust pipe opening.
- Start the engine and let run for a few minutes while observing the instrument panels and systems for correct operation.
- Drive the excavator off of the planks.
- Operate machine, check for correct function.
- Stop the engine and check for leaks. Repair as needed.

STOPPING THE ENGINE AND LEAVING THE EXCAVATOR

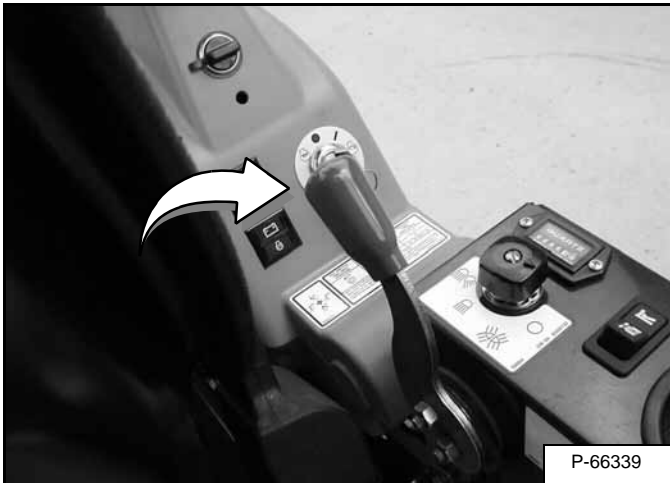
Procedure

Figure 10-180-1



Stop the machine on level ground. Lower the work equipment and the blade to the ground [Figure 10-180-1].

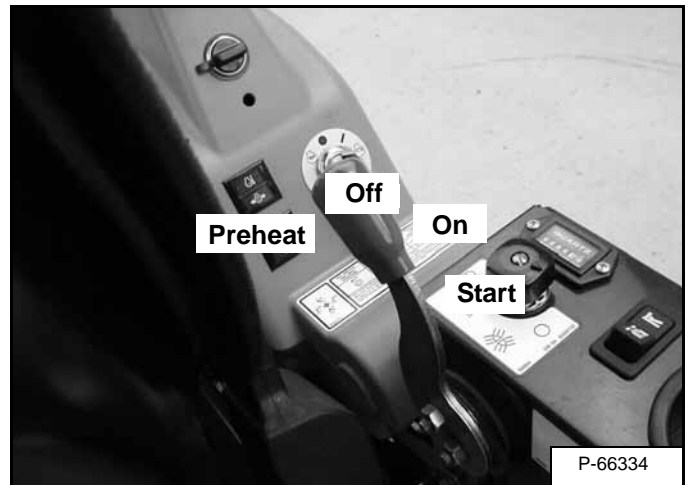
Figure 10-180-2



Move the speed control lever fully backward [Figure 10-180-2].

Run the engine at idle speed for approximately 5 minutes to allow it to cool.

Figure 10-180-3



Turn the key switch OFF [Figure 10-180-3].

Disconnect the seat belt.

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

Exit machine.

STOPPING THE ENGINE AND LEAVING THE EXCAVATOR (CONT'D)

Emergency Exits

The right side rear window and the front window provide exits.

Right Side Rear Window

Figure 10-180-4



Slide the right side rear window to the front of the excavator and exit through the side window **[Figure 10-180-4]**.

Front Window

Figure 10-180-5



Open the front window and exit **[Figure 10-180-5]**.

NOTE: If the excavator has a Special Applications Kit installed, the front window is NOT an emergency exit.

HYDRAULIC SYSTEM

HYDRAULIC SYSTEM

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HYDRAULIC/HYDROSTATIC SCHEMATIC 319 (S/N 563311001 AND ABOVE)

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V-0736legend

LEGEND

- ① HYDRAULIC RESERVOIR
(PRESSURIZED) with FILL STRAINER
Capacity 6.8 qt. (6,5 L)
- ② PRESSURIZED BREATHER/FILL CAP
with FILTER
5 PSI (0,34 bar) - Outlet
0.435 PSI (0,03 bar) - Inlet
- ③ HYDRAULIC FILTER ELEMENT
10 Micron
- ④ FILTER BY-PASS 25 PSI (1,72 bar)
- ⑤ HYDRAULIC PUMP - 3 Section Gear Pump:
3 @ 2.64 GPM (10,0 L/min.) at High Engine Idle
- ⑥ SOLENOID VALVE - SYSTEM BY-PASS
- ⑦ MAIN RELIEF VALVE:
3220 - 3420 PSI (222 - 236 bar)
- ⑧ PRESSURE REDUCING VALVE:
435 PSI (30 bar)
- ⑨ SOLENOID VALVE - CONSOLE (Joystick)
LOCK OUT
- ⑩ TEST PORT - "F" Port - (Factory Fill)
- ⑪ TEST PORT - "G" Port - Gauge Test Port
- ⑫ CHECK VALVE
- ⑬ SWING MOTOR CROSS PORT RELIEF
VALVE 2350 - 2450 PSI (162 - 169 bar)
When Tested at "G" Port
- ⑭ ORIFICE 0.063" (1.60 mm)
Bore of Tee Fitting
- ⑮ TEST PORT - Pilot Pressure
- ⑯ PORT RELIEF VALVE
Boom Cylinder (Base End)
3045 PSI (210 bar)
- ⑰ PORT RELIEF VALVE
Boom Cylinder (Rod End)
3625 PSI (250 bar)
- ⑱ PORT RELIEF VALVE
Bucket Cylinder (Base End)
3625 PSI (250 bar)
- ⑲ PORT RELIEF VALVE
Bucket Cylinder (Rod End)
3625 PSI (250 bar)
- ⑳ PORT RELIEF VALVE
Arm Cylinder (Base End)
3625 PSI (250 bar)
- ㉑ PORT RELIEF VALVE
Arm Cylinder (Rod End)
3625 PSI (250 bar)
- ㉒ ANTI-CAVITATION VALVE
- ㉓ ACCUMULATOR
Nitrogen 165 PSI (11 bar)
non-rechargeable
- ㉔ TRAVEL MOTOR SPOOL
- ㉕ BUILD UP VALVE . 218 PSI (15 bar)
- ㉖ RELIEF VALVE – Horse Power Control:
1958 PSI (135 bar)

NOTE: Unless otherwise specified
springs have NO significant
pressure value.

**Thank you very much
for your reading.**

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Information.**