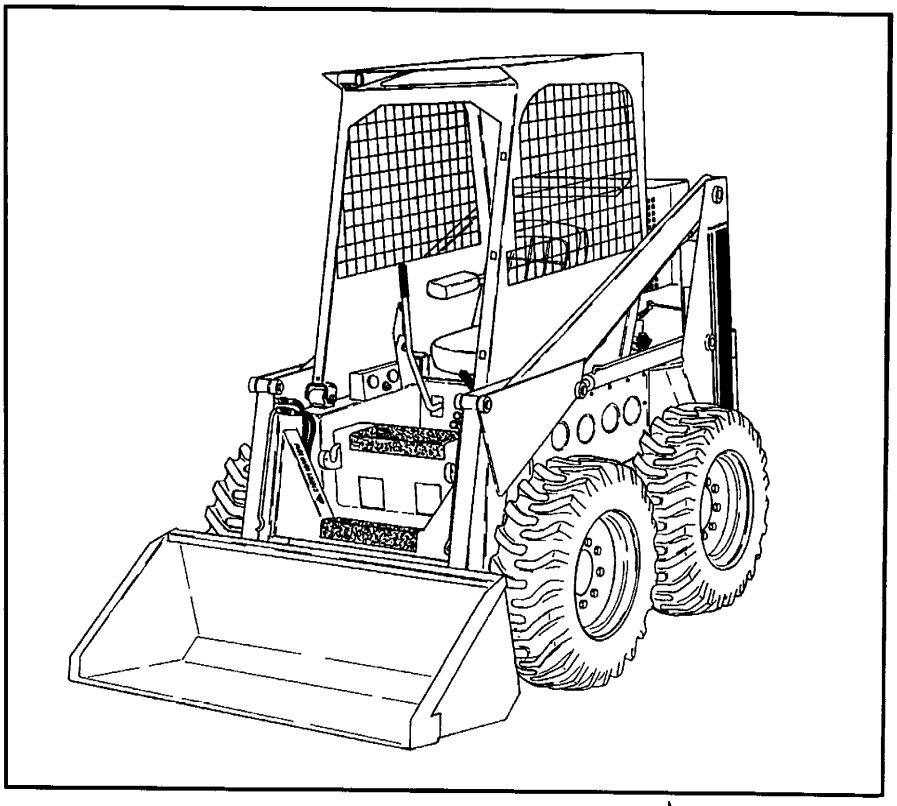
620

Service Manual



MELROE
INGERSOLL-RAND

6549846 (9–75)

Printed in U.S.A.

bobcat®

MAINTENANCE SAFETY

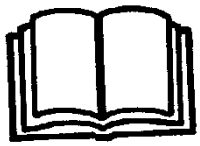
WARNING

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.

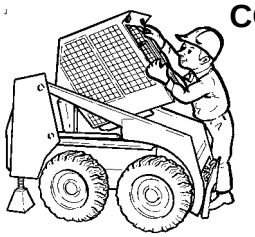
CORRECT



B-10731a

Never service the Bobcat Skid-Steer Loader without instructions.

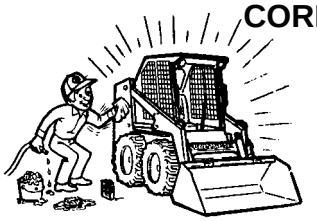
CORRECT



B-12365

Use the correct procedure to lift or lower operator cab.

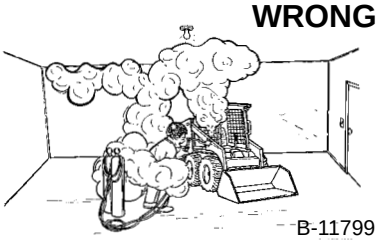
CORRECT



B-7469

Cleaning and maintenance are required daily.

WRONG



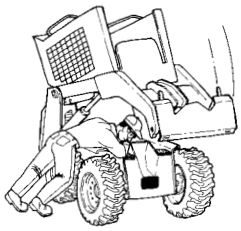
B-11799

Have good ventilation when welding or grinding painted parts.

Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.

Avoid exhaust fume leaks which can kill without warning. Exhaust system must be tightly sealed.

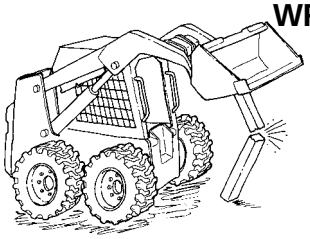
WRONG



B-15231

Disconnecting or loosening any hydraulic tubeline, hose, fitting, component or a part failure can cause lift arms to drop. Do not go under lift arms when raised unless supported by an approved lift arm support device. Replace it if damaged.

WRONG

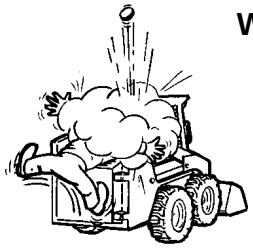


B-15280

Never work on loader with lift arms up unless lift arms are held by an approved lift arm support device. Replace if damaged.

Never modify equipment or add attachments not approved by Bobcat Company.

WRONG



B-6590

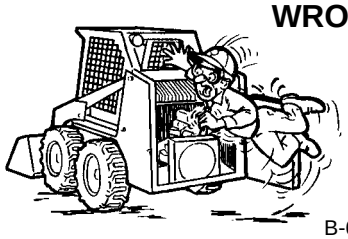
Stop, cool and clean engine of flammable materials before checking fluids.

Never service or adjust loader 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.

WRONG



B-6580

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 loader.

WRONG

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.

MSW01-0805

1–1 INTRODUCTION

1–1.1 SYMBOLS

The safety symbol is an identification of warning for important safety items in this manual. When this symbol is shown, look for the possibility of danger to personnel when doing a specific job. Carefully read and follow the instruction that follows this symbol.

WARNING

The warning symbol is an identification for warning of the possibility of damage to equipment when doing work on a specific part of the machine. Carefully read and follow the instruction that follows this symbol.

1–1.2 SERIAL NUMBER IDENTIFICATION

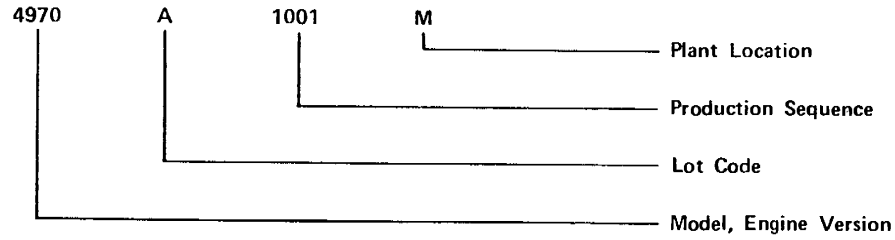
It is important to make correct reference to the serial number of the loader when making repairs or ordering parts. Early or later made models (identification made by "Lot") some times use different parts, or it may be necessary to use a different procedure in doing a specific job.

Fig. 1–1 Loader Serial Number Plate

1–1.3 LOADER SERIAL NUMBER

The loader serial number plate location is in front of and below the operators seat (Fig. 1–1).

The serial number is made up as follows:



ENGINE SERIAL NUMBER

The location of the engine serial number is on the air housing (Fig. 1–2).

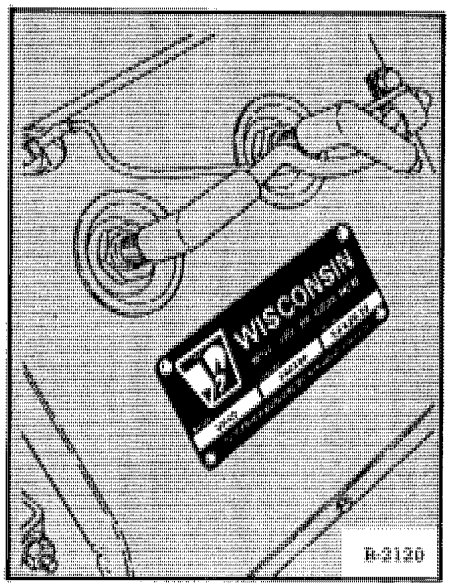


Fig. 1–2 Engine Serial Number Plate

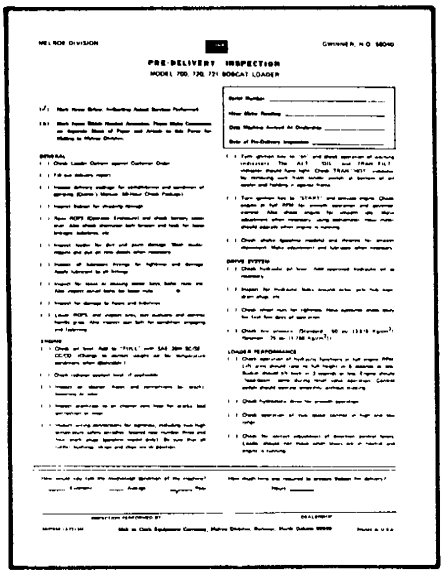
PRE–DELIVERY INSPECTION

The purpose of the pre-delivery inspection is to make sure that the loader is in correct operating condition when it comes to the dealer and before it is delivered to the customer.

The pre-delivery inspection also lets the factory know when something is wrong with the loader so that action can be taken to prevent the problem from happening in the future.

All items on the inspection for (Fig. 1–3) must be completed according to specifications in this manual.

One copy of the completed form is to be mailed to the attention of Quality Control, Melroe Division.



PRE-DELIVERY INSPECTION
MODEL 700, 720, 721 BOBCAT LOADER

Fig. 1–3 Pre-Delivery Inspection Form

50 HOUR INSPECTION

The 50 hour inspection must be completed soon after the first 50 hours of loader operation.

The purpose of the 50 hour inspection is as follows:

(1) For adjustment and inspection after first work period.

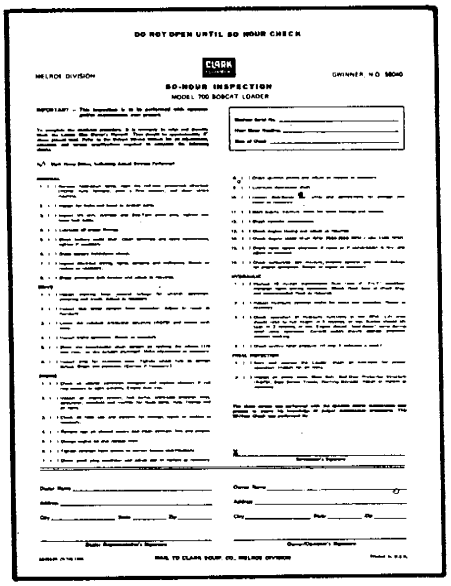
(2) To correct wrong maintenance and operating methods.

(3) For demonstration of correct service procedures to customer.

All items on the 50 hour inspection form (Fig. 1–4) must be completed by the mechanic, according to specifications in this manual.

When the 50 hour inspection has been completed, the form must be signed by the mechanic completing the inspection, dealer person and owner or operator.

One copy of the completed form is for the owner of the loader. Another copy is to be sent to the attention of Service Department, Melroe Division. The remainder copy is for the Dealer.



DO NOT OPEN UNTIL 50 HOUR CHECK

MELROE DIVISION — GWINNER, N.D. 58040

50-HOUR INSPECTION
MODEL 700 BOBCAT LOADER

Fig. 1–4 50 Hour Inspection Form

1–2 PREVENTIVE MAINTENANCE

Maintenance work must be done regularly. Failure to do so will result in damage to the machine or its engine. The service schedule has been prepared as a guide to proper maintenance of the Bobcat loader. Do not depart from this schedule unless it is to shorten the intervals due to extremely hot, cold, dusty or corrosive operating conditions.

1–3 620 BOBCAT SERVICE SCHEDULE

ITEM	SERVICE REQUIRED	HOURS				
		8	50	200	500	1000
Engine Air Cleaner	Empty dust cap, check hose, replacement of element if needed, check condition of system.	■				
Engine Oil	Check and add as necessary.	■				
Engine Cooling System	Check and clean as needed.	■				
Tires	Check for damage and correct tire pressure.	■				
All Pivot Points	Add lubricant to all fittings (12).	■				
Wheel Nuts	Check tighteness.	■				
Engine Oil and Filter	Oil and filter replacement.		■			
Battery	Check water level. Add water if needed.		■			
Transmission Fluid	Check level. Add fluid if needed.		■			
Alternator Belt	Check condition and make adjustment as needed.		■			
Distributor	Add 3 - 5 drops of oil to cap.		■			
Control Pedals and Steering	Add lubricant to all fittings.		■			
Final Drive Chains	Check for loose chains.			■		
Brakes	Check condition. Repair as needed.			■		
Engine Valve Tappets	Adjustment of valve tappets.			■		
Engine Ignition System	Check points and timing. Replacement of plugs.			■		
Engine Air Shrouding	Remove and clean shrouding and cooling fins.			■		
Engine Cylinders	Check compression: if over 90 psi (620 kPa) - remove carbon.			■		
Engine Starting Motor	Remove and clean as needed.				■	
Engine Fuel Filter	Element replacement is needed.				■	
Hydraulic Fluid Reservoir	Remove water as often as needed.				■	
Hydraulic System	Replacement of fluid and both filters.					■

1–4 AIR CLEANER SYSTEM (Fig. 1–5)

Correct maintenance of this system will increase the engine life.

The following service is needed:

(1) Remove dirt from the dust cap as often as needed.

(2) Remove the element only when it needs replacement. (When the red ring shows on the indicator.) (Fig. 1–6).

(3) When changing the element, be sure to remove dirt from the housing. Check that the gasket is in place.

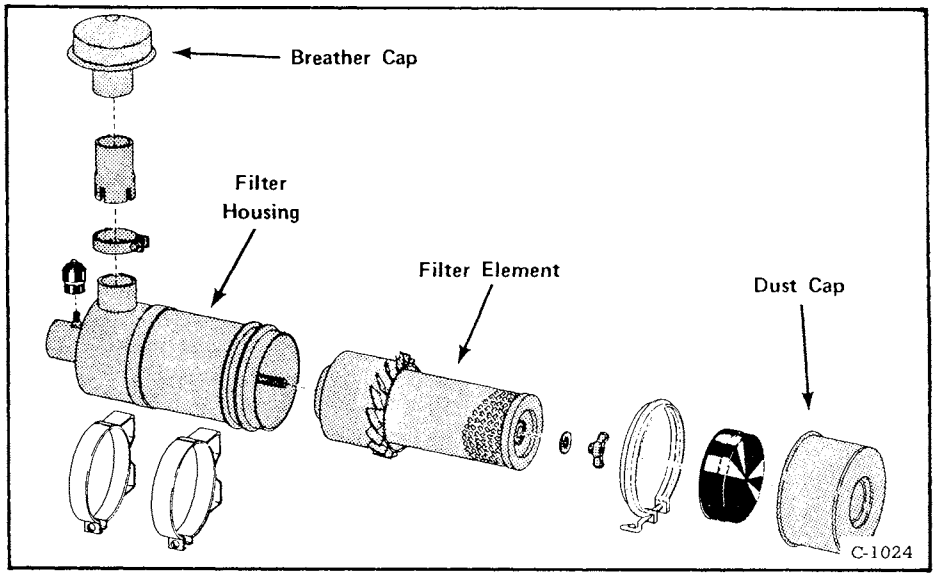


Fig. 1–5 Air Cleaner Breakdown

(4) If the air cleaner has been damaged, inspect and make replacement of parts as needed.

(5) Inspect condition of system:

1. Run engine at idle.

2. Hold hand tightly over the inlet hole (Fig. 1–7). The red ring must show on the condition indicator. If it does not, the system has a leak. Make replacement of the parts to correct the leak.

NOTE: The leak can be in the air cleaner hose or the crankcase breather hose (Fig. 1–8).

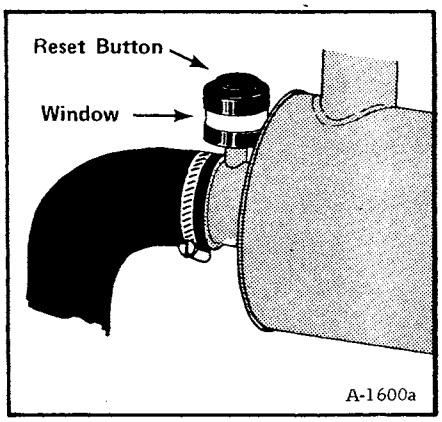


Fig. 1–6 Condition Indicator

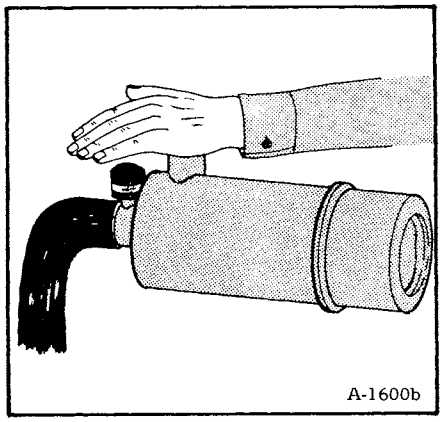


Fig. 1–7 Checking System

1–5 ENGINE FUEL SYSTEM

There is an inline fuel filter at the rear of the Bobcat. To check the filter, remove it and blow in the direction of the arrow. Install the filter with the arrow pointing toward the engine (Fig. 1–9).

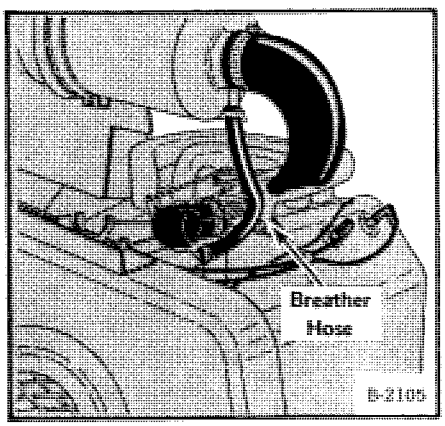


Fig. 1–8 Crankcase Breather Hose

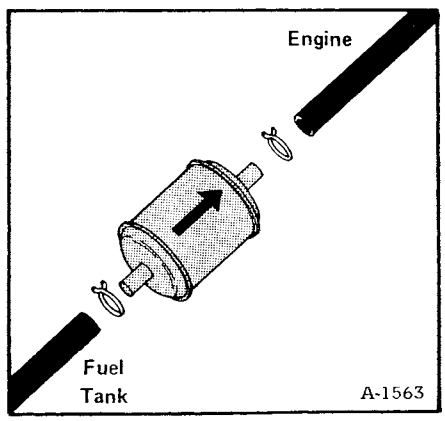


Fig. 1–9 Inline Fuel Filter

1–6 ENGINE OIL AND FILTER REPLACEMENT

Engine oil and filter on the Wisconsin engine must have replacement made every 50 hours, or more often under dirty or difficult starting conditions.

To remove oil, first run the engine a few minutes until oil is warm. Remove the access door from under the machine (Fig. 1–10). Remove plug (Fig. 1–11). To let out oil, leave plug out for at least five minutes.

When installing filter, be sure to wipe filter base clean, and put oil on the filter gasket. Filter must be installed hand-tight only. Run engine a few minutes and check filter for leaks.

See page 8–1 for oil specifications. Engine oil capacity is four quarts.

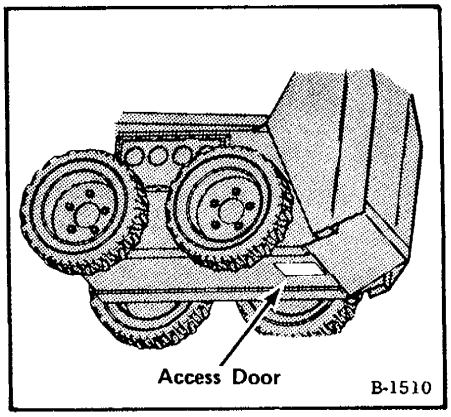


Fig. 1–10 Belly Pan

1–7 CLEANING ENGINE COOLING SYSTEM

The 620 needs regular cleaning of engine air cooling fins to prevent overheating and to get maximum engine life.

Remove engine cooling shrouding. Clean dirt, oil, etc., from cooling fins. Use a wire brush or scraper to remove hard deposits (Fig. 1–12).

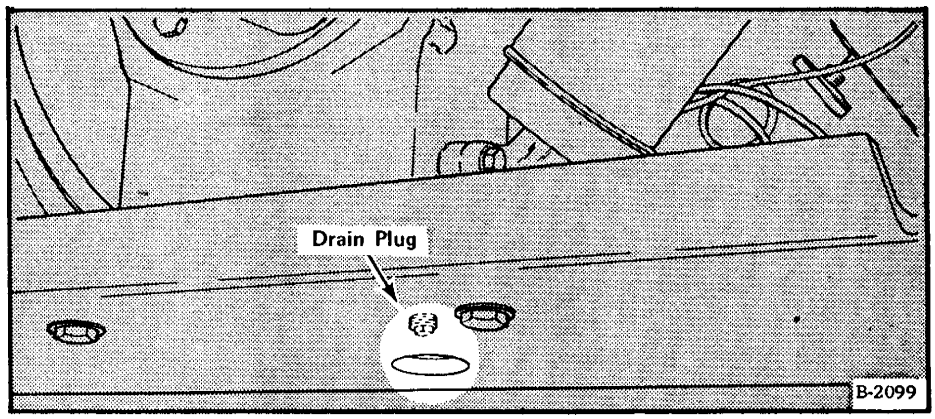


Fig. 1–11 Engine Oil Drain

TIRES

The Bobcat must be equipped with the correct tires for its application, or it will not operate correctly.

Tire Rotation: When two tires are worn more than the other two, put the worn tires on the same side. When two new tires are installed new, put both on the same side.

Tire Maintenance: Check tires regularly for damage and correct pressure.

When flotation tires are used on hard surfaces, the tire pressure can be increased to 50 PSI (345 kPa). This will make the Bobcat turn better.

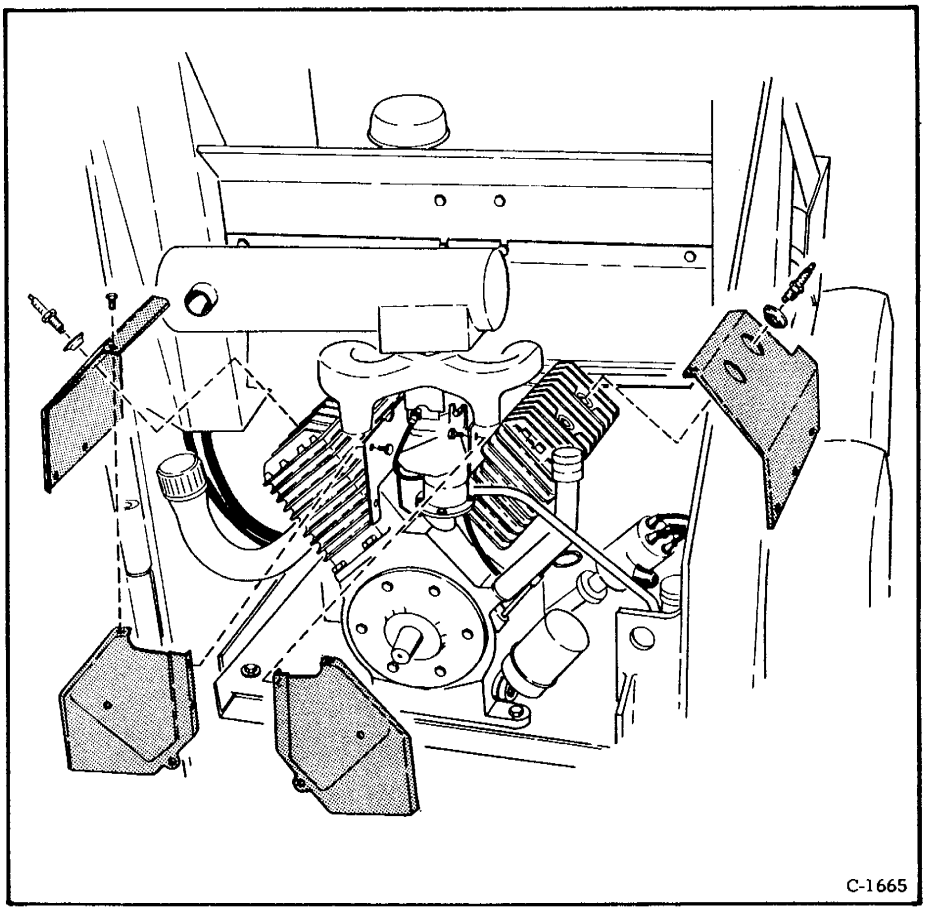


Fig. 1–12 Removal of Cylinder Head Covers & Shrouding

WARNING

Do not put fluid in the tires!

1–9 LOADER LUBRICATION

Fig. 1–13 shows the location of lubricant fittings on the loader.

There are 22 fittings (25 with 2nd Auxiliary). Also, put lubricatant on the cab tilting assembly, seat adjustment rails, and the rollers on the steering levers.

Use a good quality lithium grease for lubrication of the Bobcat.

Do not put oil on throttle, choke or governor linkage. Oil will cause tightening of linkage pivots as a result of dirt deposits.

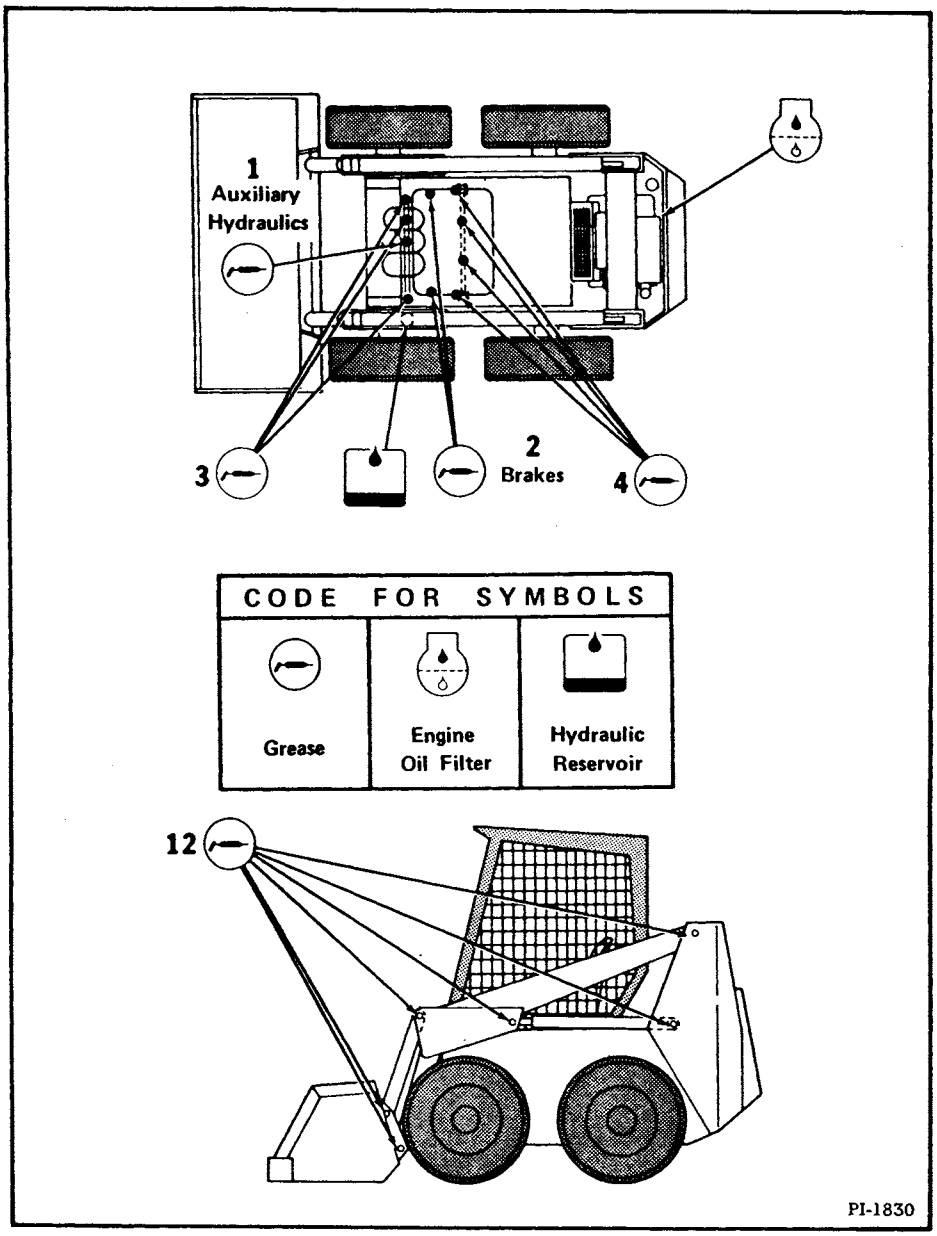


Fig. 1–13 Lubrication Points

1–10 SEAT AND SEAT BELTS

The seat is mounted on two sliding rails for adjustment. Add lubricant to rails (Fig. 1–14) to make easy movement of the seat.

Inspect condition of seat belts and buckles. Be sure the belts are tightly fastened with bolts and not damaged.

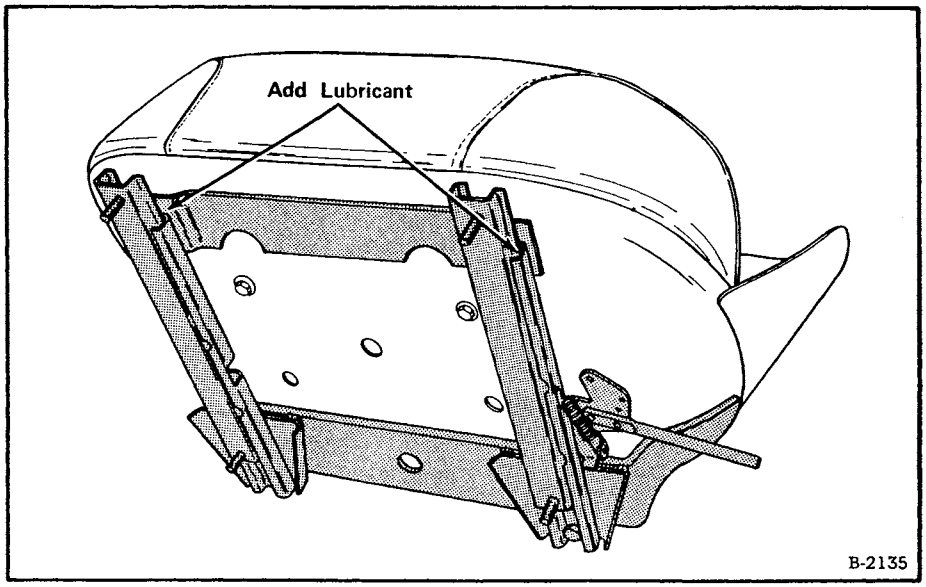


Fig. 1–14 Seat Sliding Rails

1–11 ROLL-OVER PROTECTIVE STRUCTURE

The cab tilting assembly is used to tilt the cab for maintenance of the transmission area (Fig. 1–15). If needed, the cab can be tilted fully forward, and held on a support for more working room in the transmission area (Fig. 1–16). Be sure that cab cannot fall off the support or it will break the tilt cylinder fittings.

1–12 CONTROLS

Steering linkage. Correct steering linkage adjustment must be made or the machine will move when the levers are in neutral. Refer to page 3–6 for adjustment.

Foot Pedal Adjustment. Correct pedal adjustment must be made to fit operator and to permit full movement of the valve spools.

To make adjustment: (Fig. 1–17)

(1) Remove the pins from the clevis.

(2) Turn the clevis until the adjustment is correct.

(3) After the pedal is connected to the clevis, push the pedal with the heel. There must be 1/4" (6.5 mm) minimum clearance between the bottom edge of the pedal and the floor plate.

1–13 CHOKE LINKAGE ADJUSTMENT

(1) Loosen the adjustment screw at the engine (Fig. 1–18).

(2) Hold the choke control knob about 1/8" (3 mm) from full-choke position.

(3) Hold the choke on the carburetor completely closed, then tighten the screw.

1–14 THROTTLE ADJUSTMENT

See engine section for adjustment of the governor and throttle.

WARNING

Operating the engine beyond specification for RPM will cause damage to the engine and hydrostatic system.

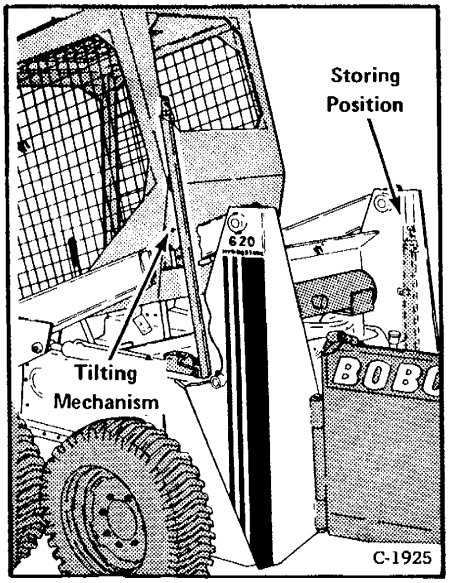


Fig. 1–15 Cab Raising Assembly

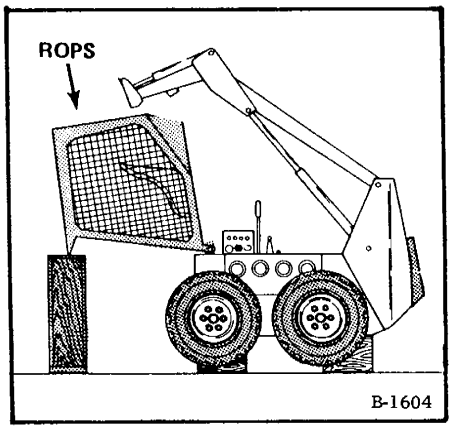


Fig. 1–16 ROPS Guard Support

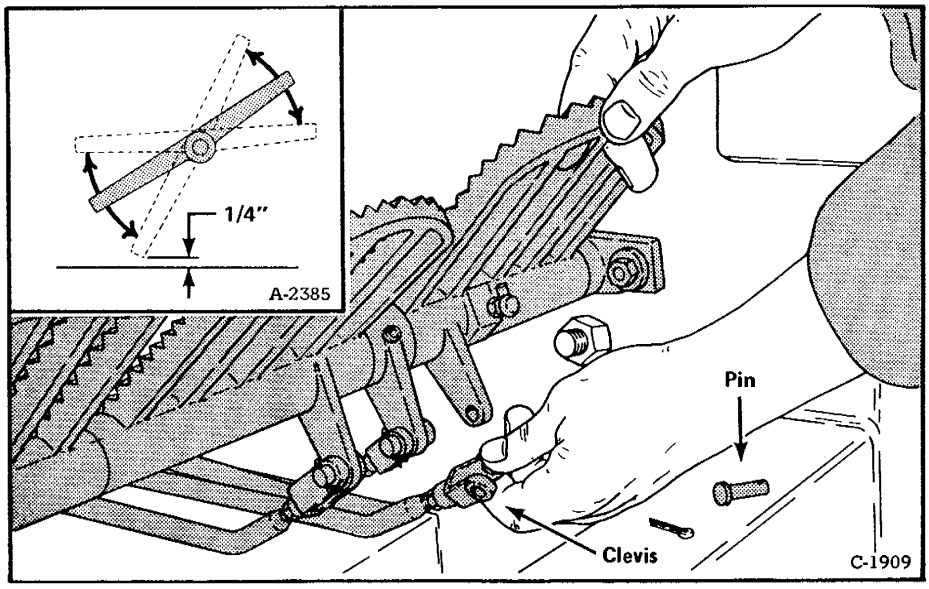


Fig. 1–17 Pedal Angle Adjustment

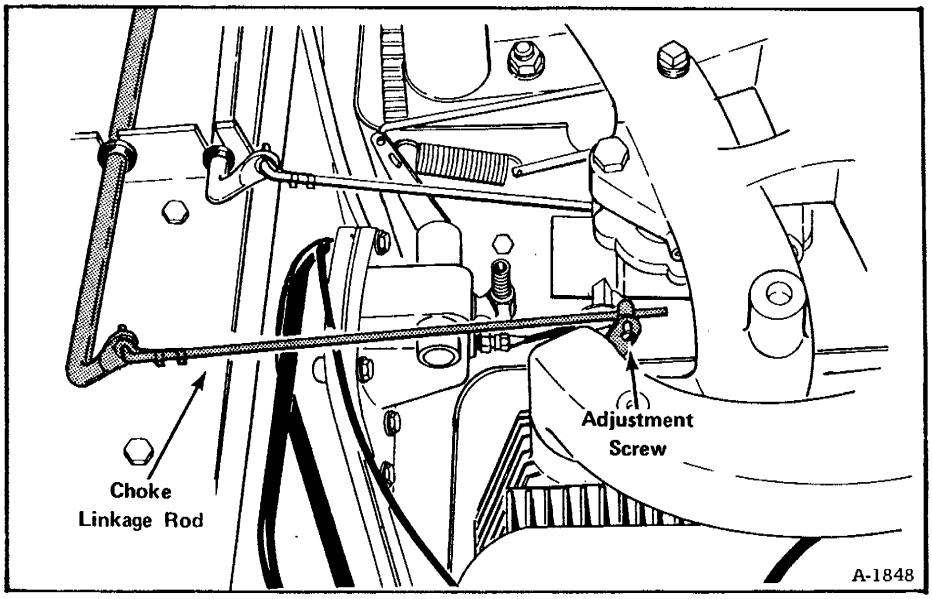


Fig. 1–18 Choke Adjustment

1–15 ELECTRICAL SYSTEM

Preventive maintenance of the electrical system is:

(1) Check battery water level.

(2) Inspect condition of battery terminals.

(3) Check condition and adjustment of generator belt.

(4) Inspect the wiring harness for damage.

(5) Check the indicator lights.

See "Electrical System Section" for adjustment and replacement of generator drive belt.

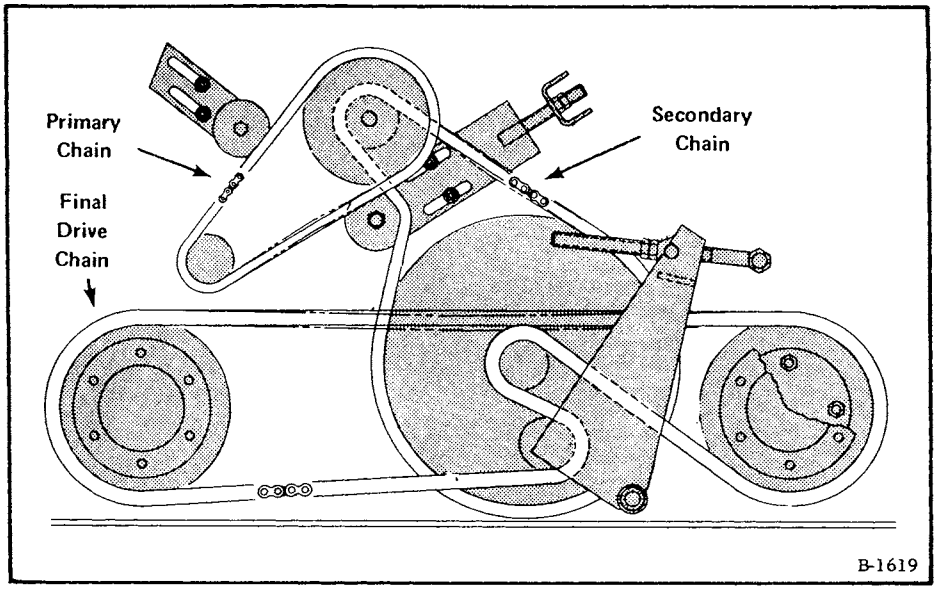


Fig. 1–19 Reduction Chain Routing

1–16 CHAIN ADJUSTMENT (Fig. 1–19)

NOTE: **There can be tight places on the chain during drive system rotation. Turn the sprockets and check chain adjustment when the chain is in tightest position. Lift the Bobcat and put it on blocks first. Use about 1 pound of force to check chain play.**

Final Drive Chain: Loosen the lock nut on the idler adjustment rod. Turn the adjustment nut until there is 1/2" (13 mm) total movement at the middle of the chain. Tighten the lock nut and check the adjustment.

Secondary Drive Chain: Loosen the two nuts which hold the idler to the tank wall and loosen the nut on adjustment rod. Turn the adjustment nut until there is 1/4" (6.5 mm) total movement at the middle of the chain. Tighten nuts on side tank and the lock nut, and check adjustment of chain.

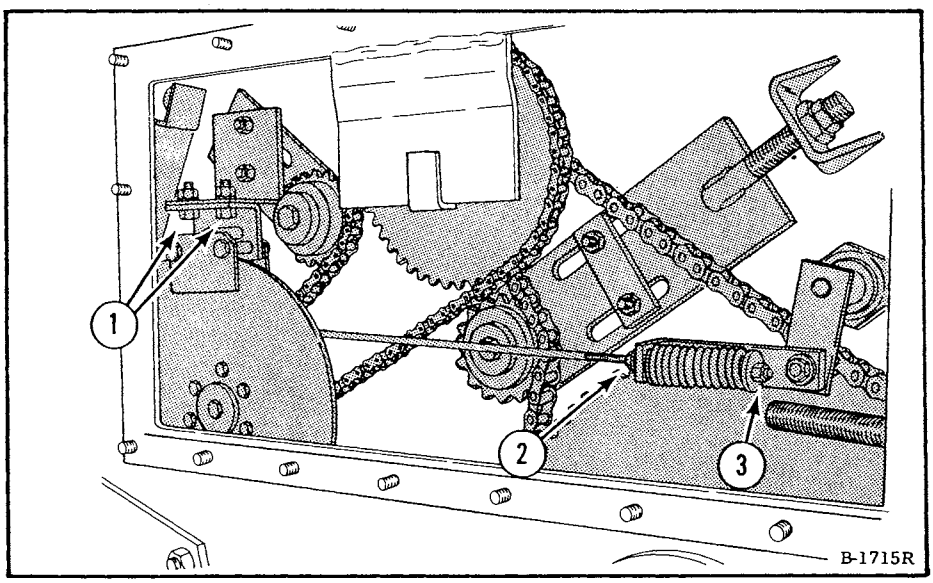


Fig. 1–20 Drive System with Brake Linkage

Primary Chain: Loosen the two nuts on the side tank. Move the idler until there is 1/4" (6.5 mm) total movement at the middle of the chain. Tighten the nuts, and check the adjustment.

1–17 BRAKE ADJUSTMENT (Fig. 1–20)

For adjustment of brakes on 620 Loader, use this method:

(1) Loosen nuts which hold the caliper assembly (Item 1).

(2) Pull brake handle into engaged position to center calipers on brake disc.

(3) Tighten nuts for holding caliper assembly (Item 1).

(4) Release brake handle and check to make sure calipers are free on brake disc.

(5) Engage brake handle again and check spring compression length. The spring must have a compression length of 2.00 to 2.15 inches (54.6 mm). Loosen nut (Item 2) and tighten nut (Item 3) until spring length is correct. After making adjustment, tighten nut (Item 2).

(6) Release brake and check to make sure calipers are free on brake disc.

1–18 HYDRAULIC/HYDROSTATIC SYSTEM SERVICE

WARNING

When servicing the hydraulic/hydrostatic system, keep all parts and area clean.

1–18.1 Hydraulic/Hydrostatic Transmission Fluid

The hydraulic system capacity is 20 gallons. The capacity of the reservoir is 17 gallons when filled to the upper check plug at the left side of the machine.

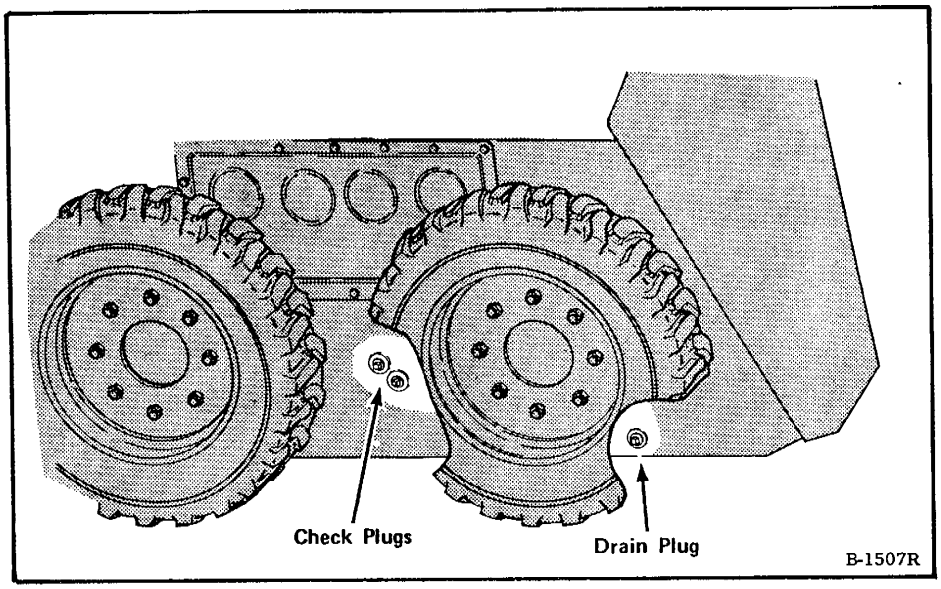


Fig. 1–21 Reservoir Check & Drain Plug

See Section 8 for oil specifications.

In very cold temperature conditions, the loader must be kept in a warm place. Extra warm-up time must be taken each time the loader is started during very cold temperature conditions. Cold oil becomes thick and will not flow easily. This can cause pump failure. Lack of oil flow to hydrostatic transmission pump (indicated by glowing "FILT" light) will cause serious damage in less than 60 seconds.

1–18.2 Checking, Adding or Changing Fluid

Fluid level is checked by removing the lower check plug at the left side of the machine. If oil does not flow from this outlet, install the plug and add fluid until it runs out the upper check outlet (Fig. 1–21). Overfilling the reservoir a small amount will not effect the operation of the machine.

The fluid and filters must be changed every 1000 hours or more often when:

(1) Operating under dirty conditions.

(2) There has been a drive system failure.

(3) The fluid is light gray in color (water in fluid).

1–18.3 Water in Reservoir

Water must be removed from the hydraulic reservoir.

(1) Lift and block the front of the Bobcat higher than the rear and leave for a few hours.

(2) Loosen the plugs at the rear of the machine on both sides (Fig. 1–21). Let the water run out, and then tighten the plugs.

1–18.4 Replacement of Suction (25 Micron) Filter (Fig. 1–22)

(1) Lift the rear of the Bobcat about 4 inches (100 mm) higher than the front and put on safe blocks.

(2) Remove access door from under the machine. Use a filter wrench to remove the filter. Remove the old gasket.

(3) Put oil on both sides of new gasket and install gasket and new filter element. Tighten hand tight.

(4) Install the access door, lower the Bobcat to the ground and drive it. Operate the hydraulic controls for about 15 minutes. If hydraulic action is still rough after this time, check the filter for air leaks.

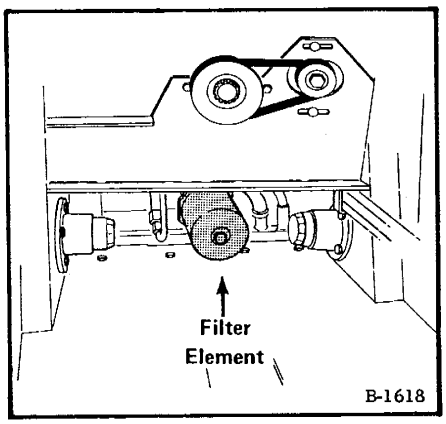


Fig. 1–22 25 Micron Filter

1–18.5 Replacement of the 10 Micron Filter (Fig. 1–23)

(1) Tilt the ROPS.

(2) Clean the area around the filter thoroughly.

(3) Remove the old filter.

(4) Put oil on the gasket and install the new filter. Tighten only about 1/2 turn. Do not over-tighten.

(5) Lower the ROPS and start the Bobcat. Check the filter for leaks after operation.

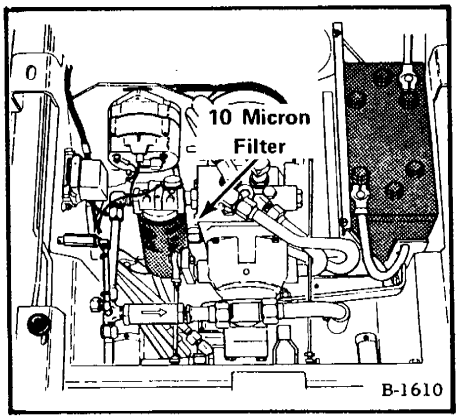


Fig. 1–23 10 Micron Filter

WARNING

If the filter light comes on and there is loss of drive or hydraulic action, stop the Bobcat. The system has lost its charge (See Section 2).

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2 LOADER HYDRAULIC SYSTEM

2–1 OPERATION OF THE HYDRAULIC SYSTEM (Fig. 2–1)

The two side tanks on the Bobcat are connected by a manifold pipe, and make up the hydraulic oil reservoir. The engine drives the vane pump through a universal joint. Hydraulic fluid circuit is as follows: From the reservoir to the 25 micron filter. From the filter to the vane pump. From the vane pump to the control valve.

When a control pedal is activated, fluid goes to the cylinders. When the cylinders come to the end of their travel, the system relief valve opens in the control valve (Fig. 2–2).

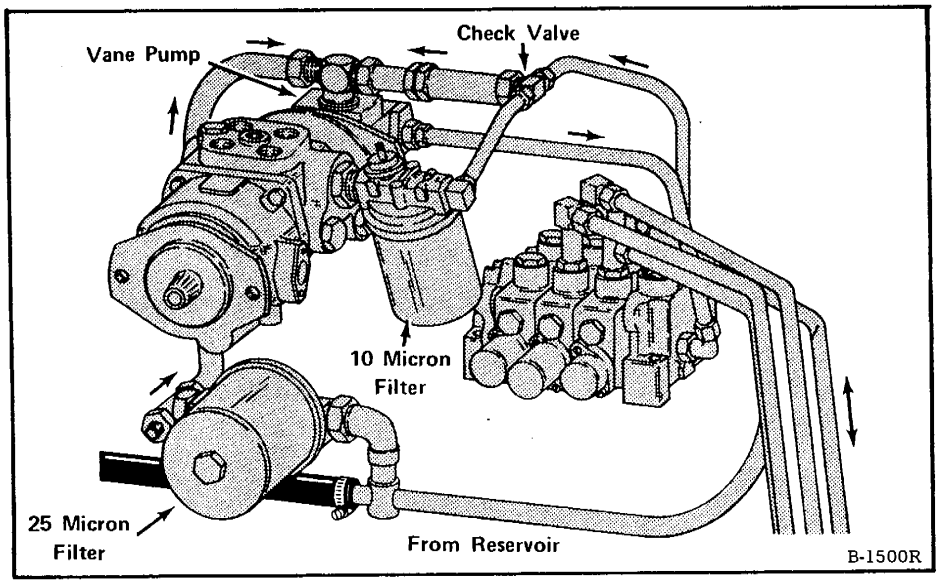

Fig. 2–1 Hydraulic System

Fluid returns from the control valve to the inlet of the vane pump through a check valve. The by-pass valve keeps back pressure on the returning oil. This makes a supply of oil for the hydrostatic system.

2–2 GENERAL INFORMATION

2–2.1 Clean Area

When making repairs on the 620 hydraulic/hydrostatic system, be careful to keep dirt from the system. If the filter replacement is done correctly, dirt can only enter when fittings are disconnected. When there is a failure in the system, always clean the connecting tubes, valves, etc., to keep dirt out of the replacement parts. When a component failure lets foreign material into the system, or when metal particles are produced in the component system, both hydraulic filters must have replacement made.

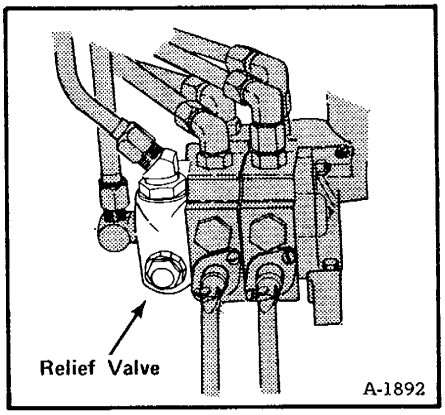

Fig. 2–2 Control Valve

2–2.2 AIR LEAKS

When the loader hydraulic/hydrostatic system becomes noisy or operation is rough, air is entering the system. The loader must be stopped and the cause for air leakage corrected. Air leaks can cause transmission damage if not repaired.

2–2.3 Tubelines, Hoses, Fittings

Correct installation of hydraulic connections can prevent damage to the Bobcat and loss of fluid.

2–2.4 37° Flare Connections

These are the most common in use in the system. Most leaks on flare fittings are caused by loose connections. To tighten flared fittings, use this method:

(1) Tighten the nut until it makes contact with the seat.

(2) Make a line from the nut to the adapter (Fig. 2–3).

(3) See the chart to find correct tightening for fitting.

Fitting Size	Rotate No. of Hex Flats
1/2"	2
5/8"	1-1/2 – 2
3/4"	1
7/8"	3/4 – 1
1"	3/4 – 1

(4) Use a wrench to turn the fitting to the correct amount shown in chart.

(5) If this does not correct the leak, remove the fitting and inspect for damage.

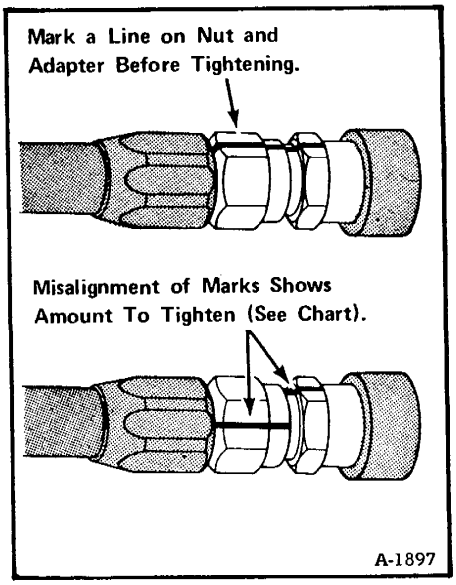

Fig. 2–3 Tightening Flared Fittings

2–2.5 Straight Thread O-ring Connections

These connections seal by compression of the O-ring. To tighten O-ring fittings, use this method:

(1) Loosen the nut and slide the washer and O-ring against the thread (Fig. 2–4. Put oil on the O-ring.

(2) Tighten the fitting in place, by hand. If the fitting is an elbow, turn it to line up with the tubeline or hose.

(3) Hold the fitting with a wrench. Use another wrench to tighten the lock nut (Fig. 2–5). The ring will fit into the space as shown.

(4) If the fitting is not turned in far enough, the O-ring will be damaged and the fitting will leak (Fig. 2–6).

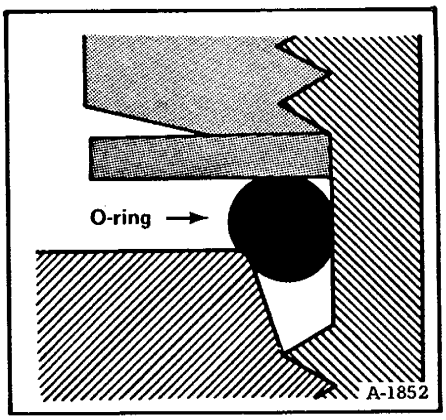

Fig. 2–4 Straight Thread Seal

2–2.6 Pipe Thread Connections

These leak at high pressure more than other connections. Put sealant on the male thread to avoid leaks. Be sure the threads are clean and not damaged.

2–2.7 Tubelines and Hoses

Bent tubelines must have replacement made or there will be restriction to flow. This will cause heat and slow hydraulic action. Exchange hoses when they show wear or damage. If not exchanged, there can be loss of oil or an accident. Be sure to use correct clamps to hold hoses and tubelines in place.

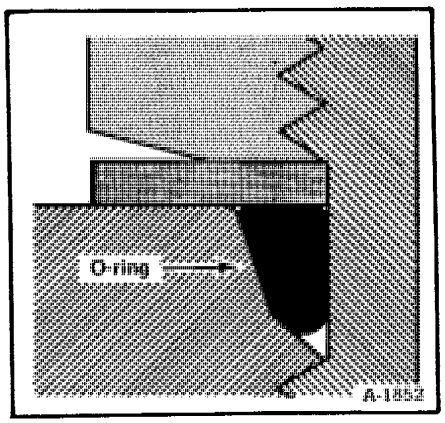

Fig. 2–5 Seal In Place

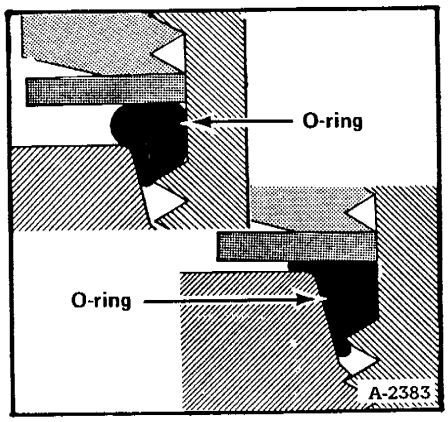

Fig. 2–6 Wrong Installation

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