SEBU5200

LUBRICATION & MAINTENANCE GUIDE

D8K TRACTOR

POWER SHIFT

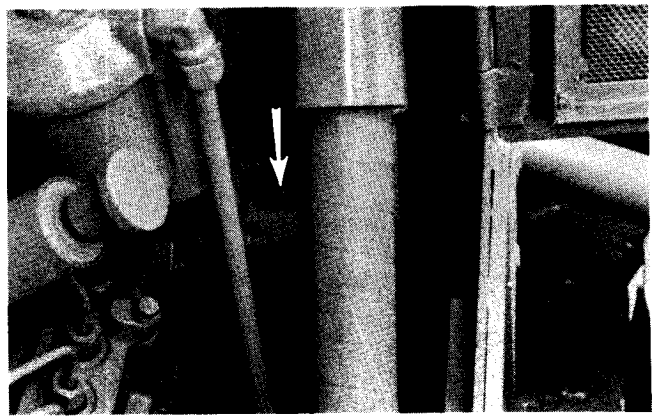
SERIAL NUMBERS	77V1-UP 66V1-UP

FOREWORD

This book is a guide to equipment care. The illustrated, step-by-step instructions are grouped by servicing intervals; items without specific intervals are listed under "When Required". Circled numbers in the Lubrication and Maintenance Chart are to key the charted items to the instructions in the book.

Use the service meter to determine servicing intervals. Calendar intervals (daily, weekly, 2 weeks, etc.) shown may be used instead of service meter intervals if it provides more convenient servicing schedules; and approximates the indicated service meter reading.

Perform previous interval items at multiples of the original requirement. For example, at 100 service hours or 2 weeks, also perform those items listed under "Every 50 Service Hours or Weekly" and "Every 10 Service Hours or Daily".



Service Meter

Some photographs in this publication may show details or attachments that may be different from your unit. Also, the ROPS, for some photographs, has been removed for illustrative purposes.

Continuing improvement and advancement of product design may cause changes to your machine which may not be included in this publication. Each publication is reviewed and revised, as required, to update and include these changes in later editions.

Whenever a question arises regarding your Caterpillar product, or this publication, please consult your Caterpillar dealer for the latest available information.

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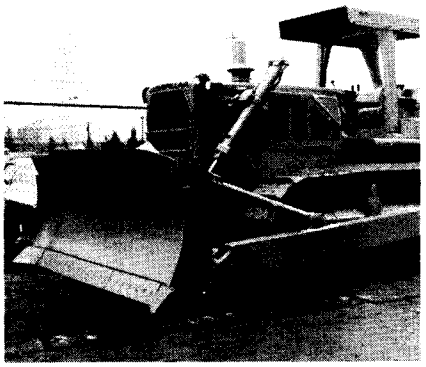
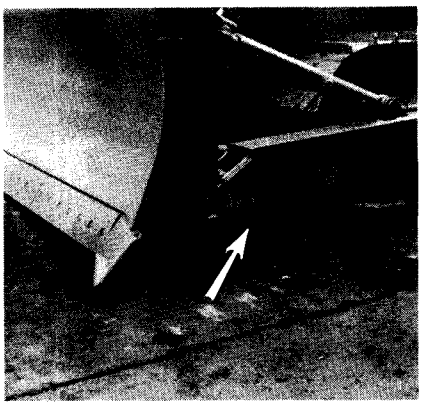
SAFETY

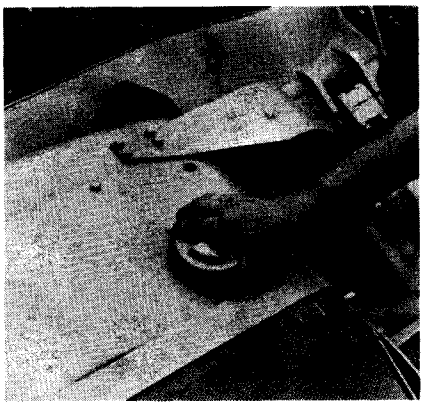
THIS SYMBOL WARNS OF POSSIBLE PERSONAL INJURY OR PROPERTY DAMAGE.



Lower all equipment before servicing hydraulic system.



Block blade before changing cutting edge or end bits.



Use caution when removing radiator cap, drain plugs, grease fittings or pressure taps.

⚠ WARNING

To avoid possible weakening of the ROPS (Rollover Protection structure), consult a Caterpillar dealer before altering the ROPS in any way. The protection offered by the ROPS will be impaired if it has been subjected to structural damage or has been involved in an overturn incident.

Do not attempt adjustments while tractor is moving or the engine running.

Wear gloves when handling cable.

Use the proper tools. Replace or repair broken or damaged equipment.

Wear safety glasses and shoes as the job requires.

Do not attempt repairs you do not understand.

⚠ WARNING

When using pressure air wear safety glasses and protective clothing. Maximum air pressure must be below 30 PSI (2 kg/cm^2).

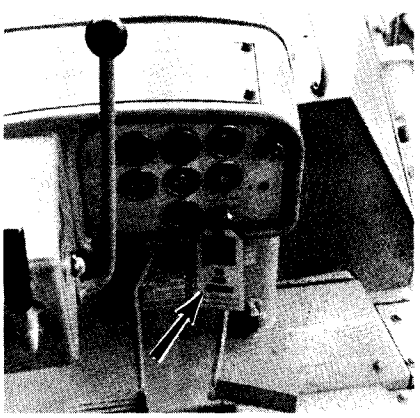
Store oily rags or other combustible material in a safe place.

Operate engine only in well ventilated area.

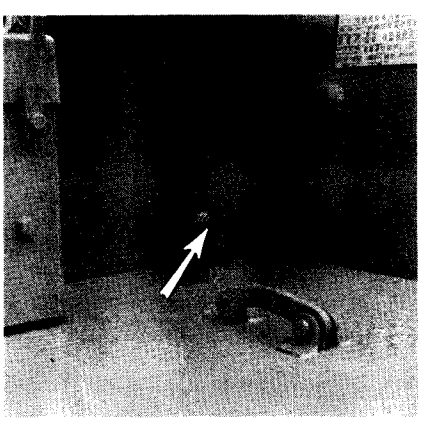
Promote good housekeeping. Keep tools and work area clean.

Do not allow unauthorized personnel on tractor when it is being serviced.

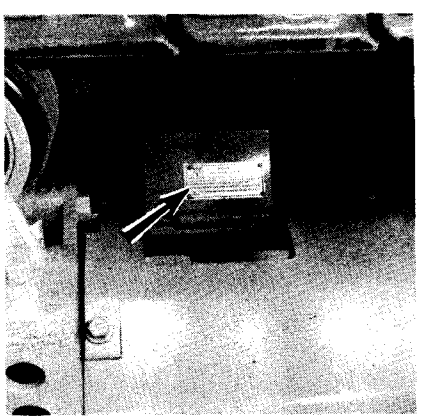
Do not smoke while refueling.



Attach warning tags to controls while tractor is being serviced.



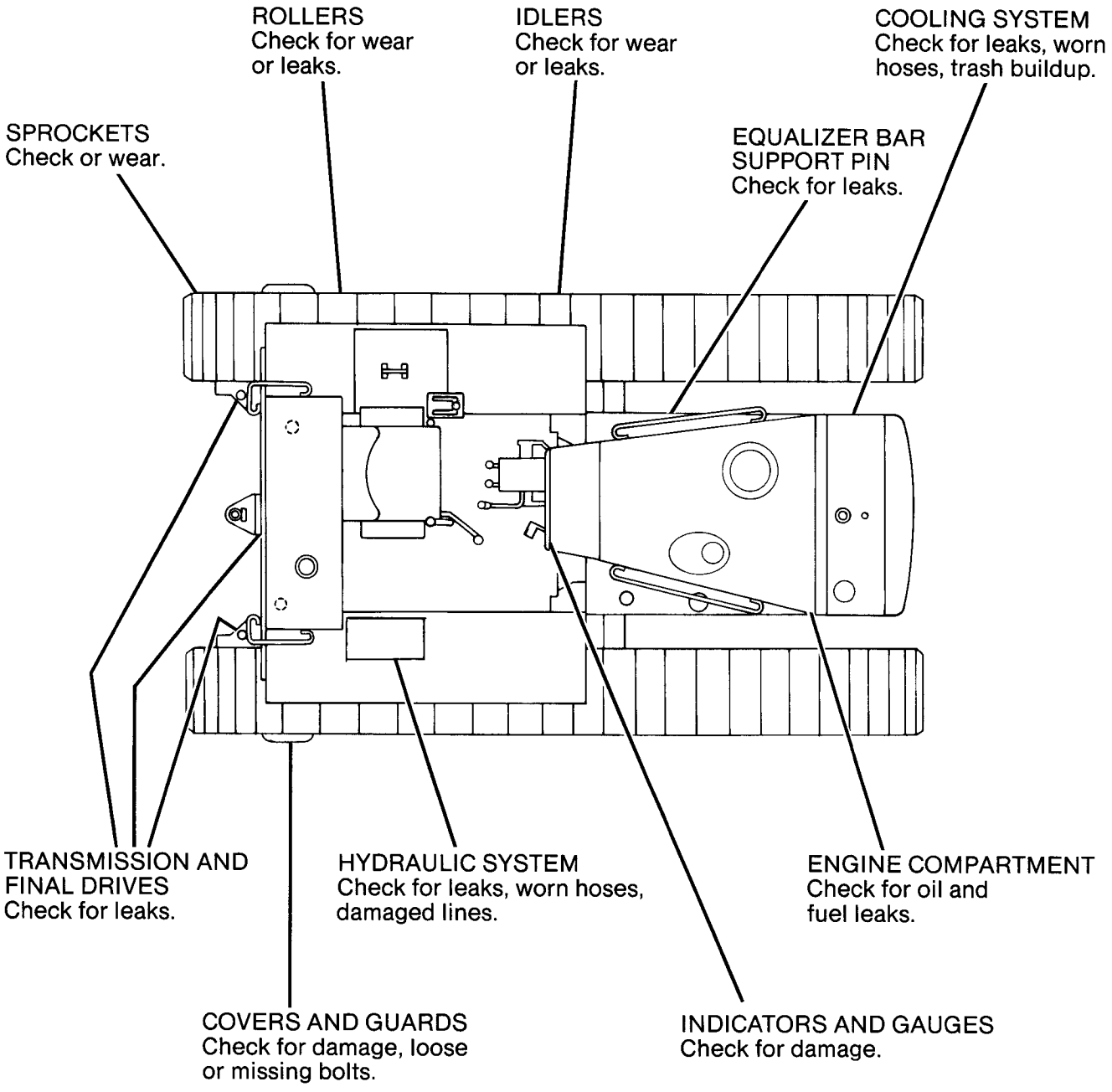
Turn disconnect switch OFF and remove key before servicing electrical system.



Read warning and caution information provided on the tractor. Follow servicing instructions carefully.

WALK-AROUND CHECKS

For maintenance and operator personnel safety, and maximum service life of the machine, make a thorough walk-around inspection when doing lubrication and maintenance work. Check under and around for such items as loose bolts, trash build-up, oil or coolant leaks.



FUEL AND LUBRICANT SPECIFICATIONS

NOTE

The abbreviations listed below follow S.A.E. J754 nomenclature. The classifications follow S.A.E. J183 classifications. The MIL specifications are U.S.A. Military Specifications. These definitions will be of assistance in purchasing. The specific classifications for this engine are found on the "RECOMMENDED LUBRICANTS" chart.

Diesel Fuel

Use only distillate fuels (ASTM No. 1 or No. 2 Fuel Oil or No. 1D or No. 2D Diesel Fuel Oil) with a minimum cetane number of 35. Heavier oil is generally preferable because of its higher energy content. Contact your Caterpillar dealer regarding fuels marketed in your area.

Engine Oils (EO)

CD - Use oils that meet Engine Service Classification **CD** or MIL-L-2104C.

CC - Use oils that meet Engine Service Classification **CC**, MIL-L-2104B or MIL-L-46152.

EO - **CD** or **CC**.

Lubricating Grease (MPGM)

Use Multipurpose-type Grease (**MPGM**) which contains 3-5% molybdenum disulfide conforming to MIL-M-7866, and containing a suitable corrosion inhibitor. NLGI No. 2 Grade is suitable for most temperatures. Use NLGI No. 0 or No. 1 Grade for extremely low temperatures.

Hydraulic Oil (HYDO)

Use (**EO**) or industrial-type hydraulic oils (**HYDO**) which are certified by the supplier as having anti-wear, anti-foam, anti-rust and anti-oxidation additive properties for heavy duty use.

Multipurpose-type Gear Lubricant (MPL)

Use Gear Lubricant Classification GL-5, or MIL-L-2105B.

RECOMMENDED LUBRICANTS AT STARTING TEMPERATURES FROM −10°F (−23°C) to +120°F (+48°C)[1]

COMPARTMENT OR SYSTEM	STARTING TEMPERATURES	
	ABOVE 32°F A (0°C)	BELOW 32°F (0°C)
CD		
Engine Crankcase	SAE 30	SAE 10W[2]
Transmission, Bevel Gear and Steering Clutches	SAE 30	SAE 10W
Winch Oil Sump	SAE 30	SAE 10W
Cable Control Gear Case	SAE 30	SAE 10W
Track Rollers and Idlers	SAE 30	SAE 30
HYDO		
Hydraulic System	SAE 10W	SAE 10W
	EO	
Final Drives	SAE 50	SAE 30
	MPL	
Equalizer Bar Support Pin	SAE 90	SAE 90
Sealed and Lubricated Track	SAE 90	SAE 90

[1]Below −10°F (−23°C) consult your Caterpillar dealer for Cold Weather Recommendations.

[2]SAE 10W oil may be used in the diesel engine even if daytime ambient temperature rises to 70°F (21°C). Below −10°F (−23°C) it may be necessary to warm the engine oil so the engine can be cranked and the oil will circulate freely.

Key to Lubricants:

CD - Engine Service Classification **CD**, or MIL-L-2104C

CC - Use oils that meet Engine Service Classification **CC**, MIL-L-2104B or MIL-L-46152

EO - **CD** or **CC**

MPL - GL-5 or MIL-L-2105B

HYDO - **EO**, or certified Industrial-type Hydraulic Oils

MPGM - Multipurpose-type Grease with 3 to 5% Molybdenum Disulfide.

LUBRICATION AND MAINTENANCE CHART

ITEM	SERVICE	LUBRICANT	MAINTENANCE	PAGE NO.
EVERY 10 SERVICE HOURS OR DAILY				
① Engine crankcase	Check oil level			9
② Radiator	Check coolant level		●	9
EVERY 50 SERVICE HOURS OR WEEKLY				
③ Ripper linkage	Lubricate 12 fittings	MPGM		9
EVERY 100 SERVICE HOURS OR 2 WEEKS				
④ Cable control sheave bearings	Lubricate 6 fittings	MPGM		10
⑤ Hydraulic control system[1]	Check oil level	HYDO		10
⑥ Batteries	Check electrolyte level		●	10
EVERY 250 SERVICE HOURS OR MONTHLY				
⑦ Engine crankcase	Change oil[2] and filter element, wash breather	CD	●	11
⑧ Transmission, bevel gear and steering clutch compartment	Change filter elements and wash magnetic strainer	CD	●	11
⑨ Bulldozer cylinder support and upper trunnion bearings	Lubricate 6 fittings	MPGM		12
⑩ Track roller frame inner bearings	Lubricate 2 fittings	MPGM		13
⑪ Fan and adjusting pulley bearings	Lubricate 2 fittings	MPGM		13
⑫ Bulldozer tilt brace	Lubricate 2 fittings	MPGM		13
⑬ Cable control shroud bearings	Lubricate 6 fittings	MPGM		13
⑭ Cable control clutch lever rollers	Lubricate 2 fittings	MPGM		13
⑮ Cable control lever shaft and brake lever bearings	Lubricate 4 fittings	MPGM		14
⑯ Parking brake lever	Check to see if it engages		●	14
⑰ Steering clutch brakes	Check — adjust if necessary		●	14
⑱ Fan and alternator belts	Check — adjust if necessary		●	15
EVERY 500 SERVICE HOURS OR 3 MONTHS				
⑲ Hydraulic control system[4]	Change filter elements	HYDO	●	15
⑳ Winch magnetic strainer	Wash magnetic strainer		●	16
㉑ Winch filter	Change filter		●	16
EVERY 1000 SERVICE HOURS OR 6 MONTHS				
㉒ Transmission, bevel gear and steering clutch compartment[3]	Change oil and plastic breathers	CD	●	16
㉓ Final drives	Change lubricant — filter element — breather	EO		17
㉔ Winch oil sump	Change oil	CD		17
㉕ Universal joint	Lubricate 2 fittings	MPGM		18

LUBRICATION AND MAINTENANCE CHART

ITEM	SERVICE	LUBRICANT	MAINTENANCE	PAGE NO.
EVERY 1000 SERVICE HOURS OR 6 MONTHS (Continued)				
(26) Cable control fairlead sheave lower bearings	Lubricate 2 fittings	MPGM		18
(27) Cable control	Wash breather		●	18
(28) Winch breather	Change plastic breather		●	18
EVERY 2000 SERVICE HOURS OR 1 YEAR				
(29) Hydraulic control system	Change oil — wash filler screen	HYDO		19
(30) Cable control gear case	Change oil	CD		19
(31) Engine valve lash	Check — adjust if necessary		●	20
(32) Cooling system	Renew coolant antifreeze solution		●	23
WHEN REQUIRED				
(33) Transmission, bevel gear, and steering clutch compartment	Check oil level if leakage develops or is suspected	CD		24
(34) Torque divider suction screen	Clean when oil becomes thick or at time of repairs on brakes, transmission or torque divider		●	24
(35) Cable control	Check oil level if leakage develops or is suspected, adjust brake and clutch if necessary and check condition of cable	CD	●	25
(36) Winch	Check oil level if leakage develops or is suspected and check condition of cable		●	27
(37) Final drives	Check lubricant level if leakage develops or is suspected	EO		28
(38) Track	Make adjustment if track sag is not 1½" to 2"		●	28
(39) Prescreen	Check — clean if necessary		●	29
(40) Engine air inlet system	Clean when RED band in indicator locks in visible position		●	30
(41) Cooling system	Drain and clean when engine overheats or solution is dirty		●	33
(42) Fuel system	Change filter when fuel gauge registers OUT with engine running		●	34
(43) Fuel tank	Drain moisture and sediment, wash cap whenever engine misfires or frequent fuel filter replacement is required		●	35
(44) Hydraulic cylinders	Make rod packing adjustment if leakage develops or is suspected		●	35
(45) Ripper tips	Change ripper tips if damaged or worn		●	36

LUBRICATION AND MAINTENANCE CHART

ITEM	SERVICE	LUBRICANT	MAINTENANCE	PAGE NO.
WHEN REQUIRED (Continued)				
㊻ Bulldozer ball sockets	Make adjustment if brace is too loose		●	36
㊼ Cutting edge and end bits	Change cutting edge and use new end bits, if worn		●	37

(1)Check frequently if any signs of leakage develop or are suspected.

(2)Normal change interval when sulphur content is 0.4% or less. When sulphur content is 0.4% to 1.0%, reduce oil change interval one-half. When sulphur content is above 1.0%, reduce oil change to one-fourth the normal interval.

(3)Change oil any time it becomes thick and black.

(4)Change earlier if filter indicator shows RED with engine running and oil at operating temperatures.

Key to Lubricants:

CD - Engine Service Classification **CD**, or MIL-L-2104C

CC - Engine Service Classification **CC**, MIL-L-2104B or MIL-L-46152

EO - **CD**, **CC**

HYDO - **EO** or certified Industrial-type Hydraulic Oils

MPGM - Multipurpose-type Grease with 3 to 5% Molybdenum Disulfide

General Service Recommendations

NOTE

The engine cooling system is protected to −20°F (−29°C), with permanent-type antifreeze, when shipped from the factory.

Fill fuel tank at the end of each day of operation to drive out moisture laden air and prevent condensation.

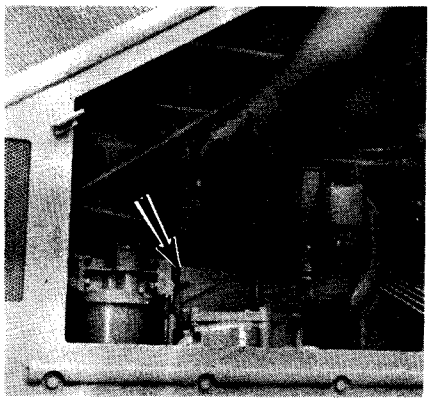
Check fuel level with dipstick in filler opening.

Use clean water that is low in scale forming minerals, not softened water.

Add Caterpillar Corrosion Inhibitor to coolant. Follow recommendation given on container.

EVERY 10 SERVICE HOURS OR DAILY

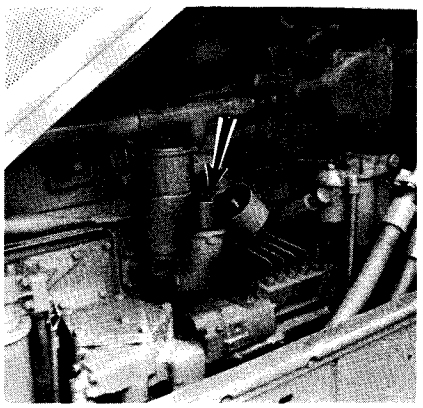
① ENGINE CRANKCASE



1. Check oil level. Machine must be level and brake lock applied. Check can be made . . .

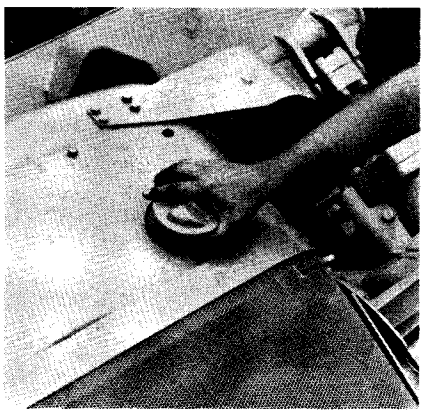
2. . . . before starting. Level must be in SAFE STARTING RANGE on ENGINE STOPPED side of dipstick, or . . .

3. . . . with engine warm and running. Maintain level between ADD and FULL marks on ENGINE RUNNING side of dipstick.

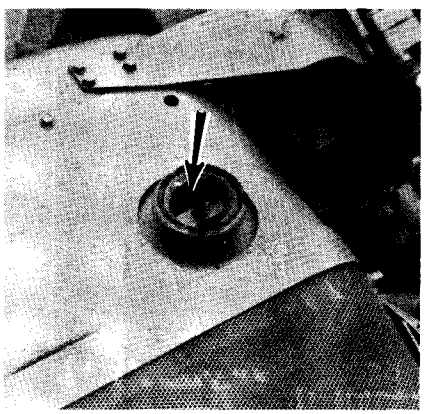


4. Add oil as necessary, through crankcase fill pipe.

② RADIATOR



1. Check coolant level with engine stopped. Remove cap slowly to relieve pressure.

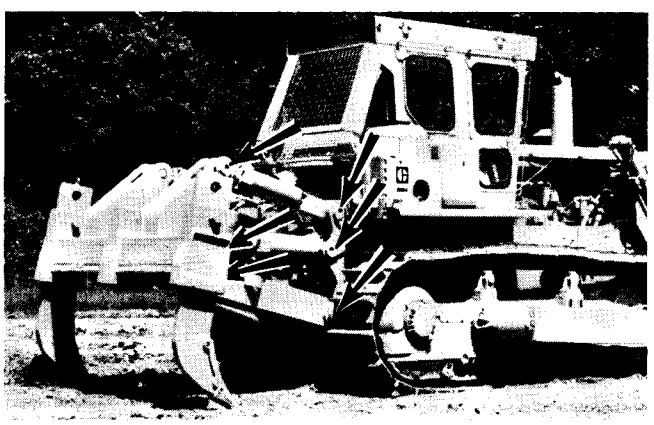


2. Maintain level to within ½ inch (1 cm) of bottom of fill pipe.

3. Use clean water that is low in scale forming minerals, not softened water.

EVERY 50 SERVICE HOURS OR WEEKLY

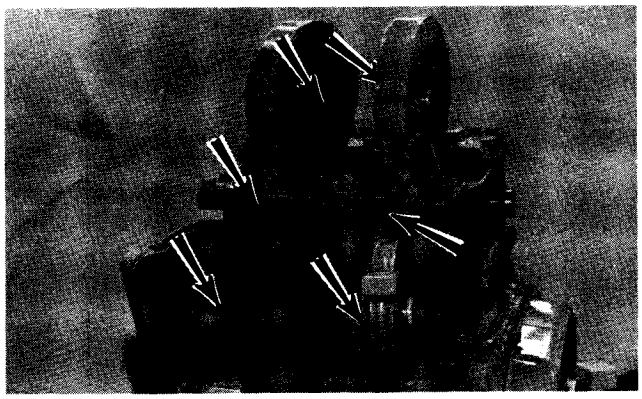
③ RIPPER LINKAGE



Lubricate 12 fittings.

EVERY 100 SERVICE HOURS OR 2 WEEKS

④ CABLE CONTROL SHEAVE BEARINGS

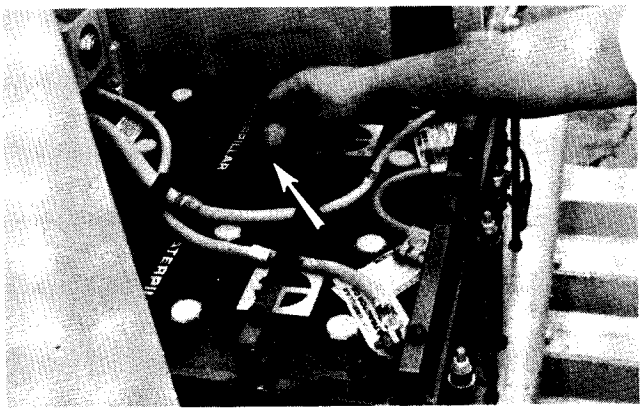


Lubricate 6 fittings.

⑤ HYDRAULIC CONTROL SYSTEM

Check oil level with equipment lowered (engine running at low idle, transmission in NEUTRAL, brake lock engaged). Oil should be visible in sight gauge.

⑥ BATTERIES



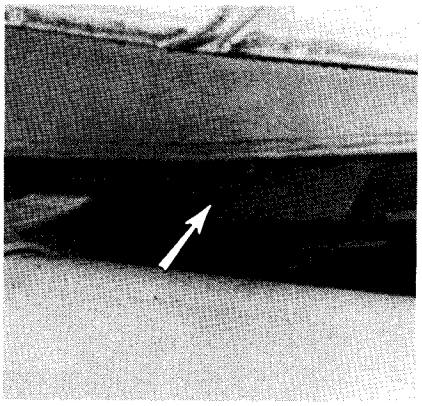
Maintain electrolyte level at triangle in fill plug opening.

NOTE

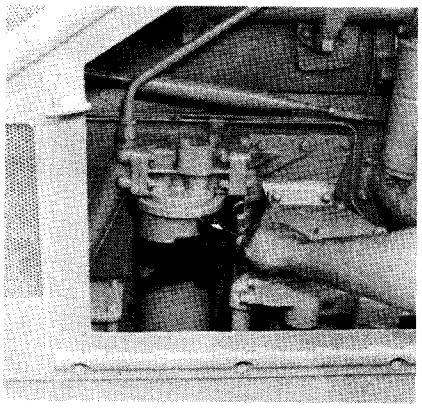
At proper charging rate, batteries will not require more than 1 ounce (30 cc) of water per cell per week. Keep batteries clean.

EVERY 250 SERVICE HOURS OR MONTHLY

⑦ ENGINE CRANKCASE

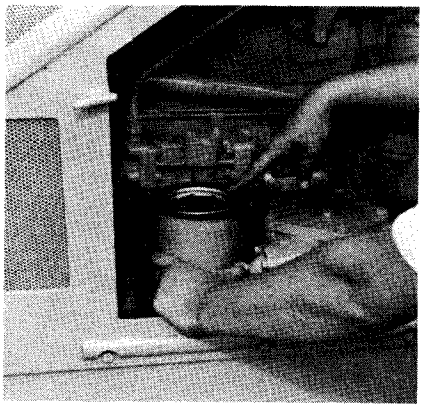


1. Run engine long enough to warm oil. Park on level ground. Stop engine. Open drain valve and drain oil.



2. Remove old filter.

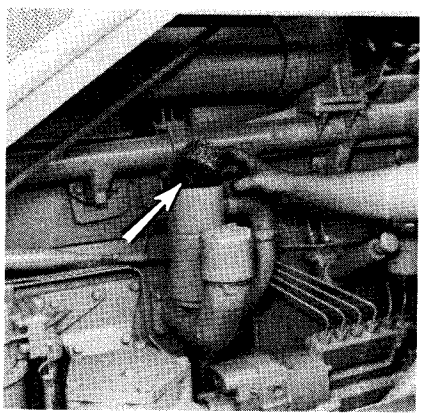
3. Clean filter base. Make sure all of old gasket is removed.



4. Apply thin film of clean oil to gasket of new filter.

5. Install filter, tighten until gasket contacts base. Tighten filter an additional ¾ turn. Do not overtighten.

6. Close drain valve.



7. Remove breather. Wash breather in clean solvent.

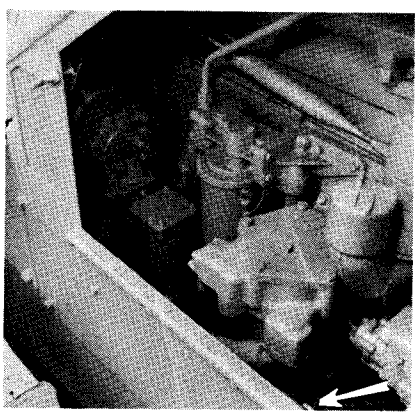
8. Inspect seal, install new seal if necessary. Install breather. Tighten bolt.

9. Fill crankcase. See Refill Capacities.

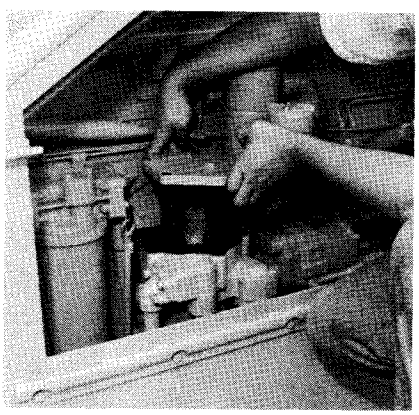
10. Start engine and run at low idle to fill filter housing. Check oil level. Add oil if necessary.

11. Check for leaks.

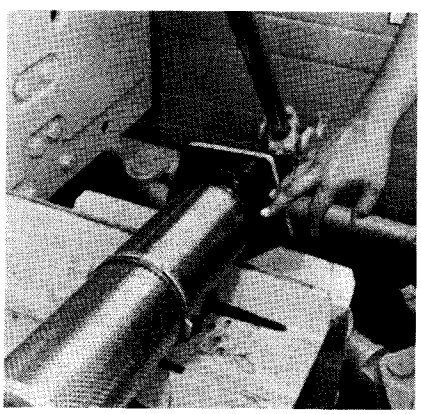
⑧ TRANSMISSION, BEVEL GEAR AND STEERING CLUTCH COMPARTMENT



1. Remove filter plug and allow oil to drain.

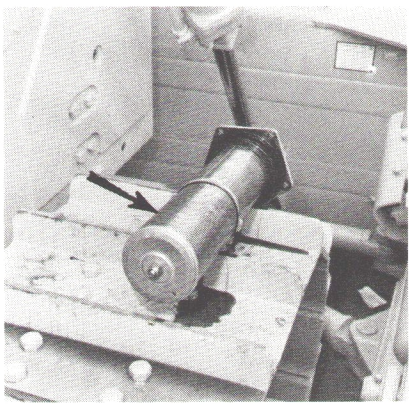


2. Remove cover and old elements.

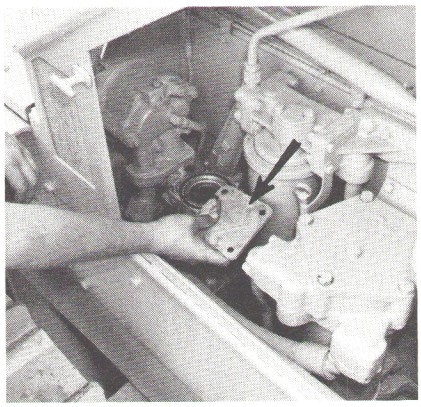


3. Clean cover and inspect seals Install new seals if necessary.

EVERY 250 SERVICE HOURS OR MONTHLY



4. Secure new elements to cover. Install elements, cover and drain plug.



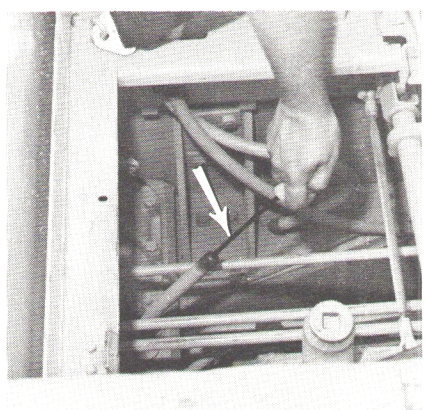
5. Remove cover, spring, screen and magnets from magnetic strainer. Wash screen in clean solvent. Clean magnets with a stiff brush , a clean cloth or pressure air. Do not drop or rap magnets.

⚠ WARNING

When using pressure air wear safety glasses and protective clothing. Maximum air pressure must be below 30 PSI (2 kg/cm^2).

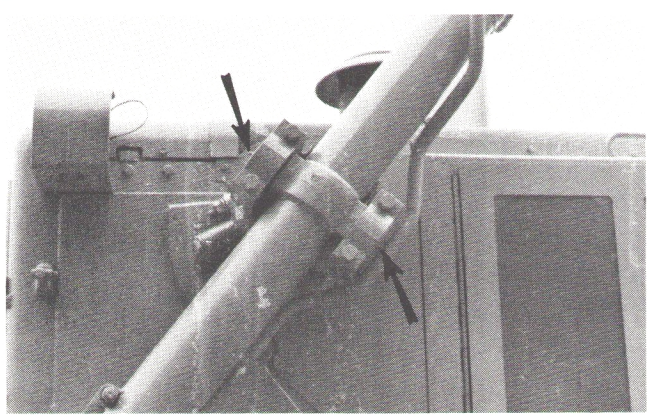
6. Clean cover and check seal. Install new seal if necessary.

7. Install magnets, screen, spring and cover.

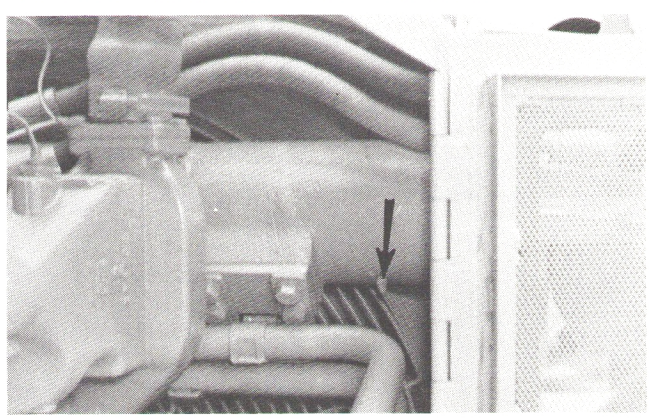


8. Start and run engine at low idle to fill filter. Add oil to bring level to FULL mark on dipstick.

⑨ BULLDOZER CYLINDER SUPPORT AND UPPER TRUNNION BEARINGS

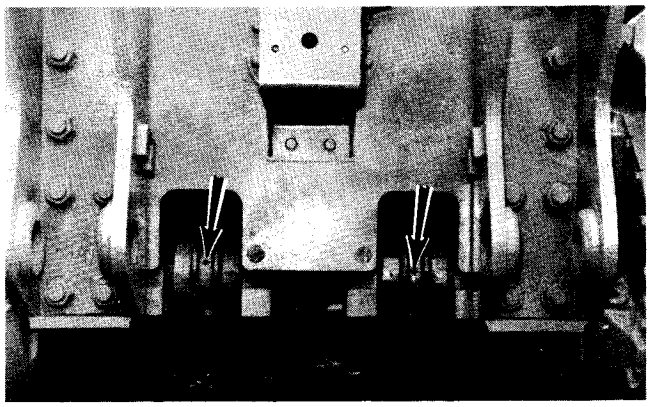


1. Lubricate 2 fittings on each side of tractor. Total 4 fittings.



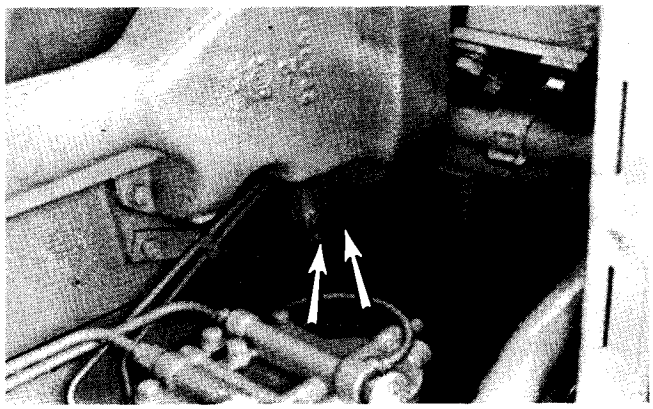
2. Lubricate 1 fitting on each side of tractor, total 2 fittings.

⑩ TRACK ROLLER FRAME INNER BEARINGS



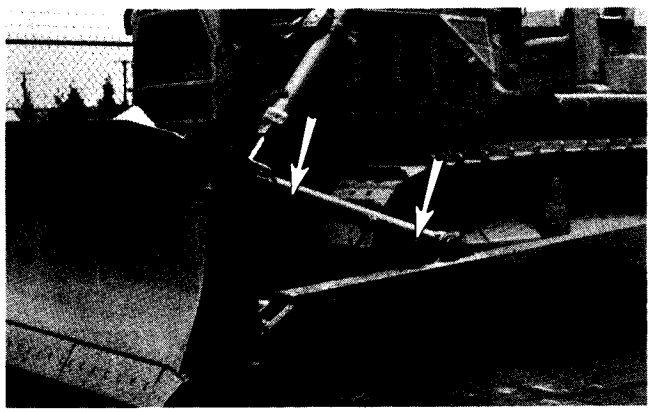
Lubricate 2 fittings.

⑪ FAN AND ADJUSTING PULLEY BEARINGS



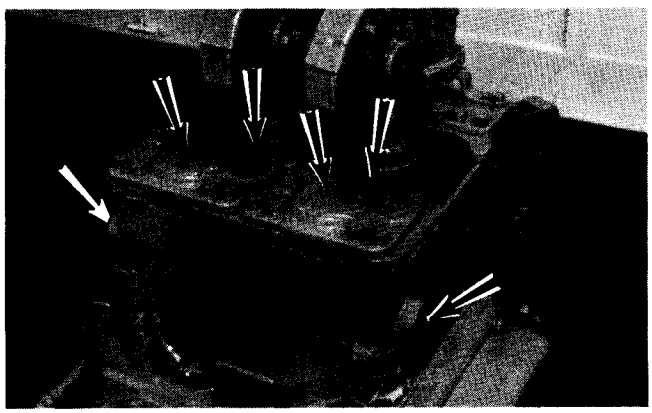
Lubricate 2 fittings.

⑫ BULLDOZER TILT BRACE



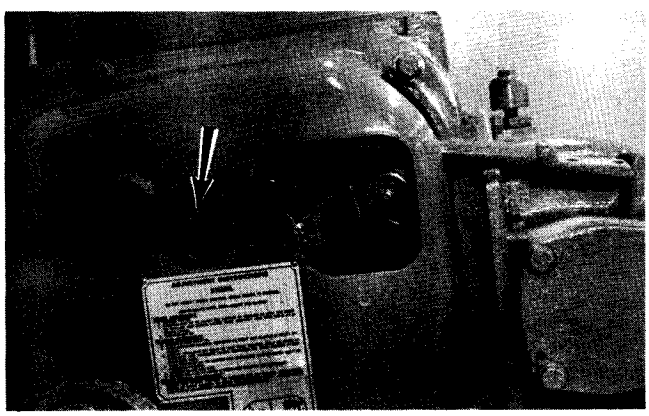
Lubricate 2 fittings.

⑬ CABLE CONTROL SHROUD BEARINGS



Lubricate 6 fittings.

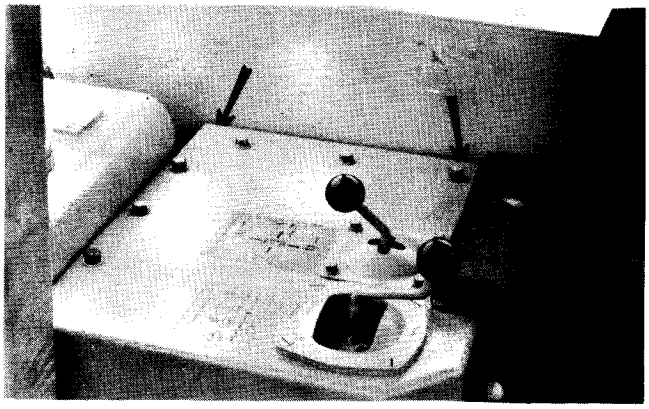
⑭ CABLE CONTROL CLUTCH LEVER



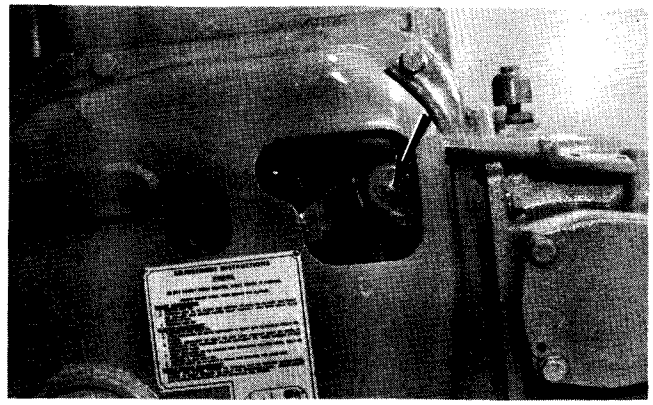
Lubricate 1 fitting on each side of cable control. Total 2 fittings.

EVERY 250 SERVICE HOURS OR MONTHLY

⑮ CABLE CONTROL LEVER SHAFT AND BRAKE LEVER BEARINGS

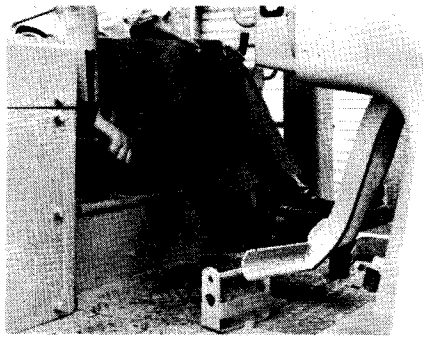


1. Lubricate 2 fittings.



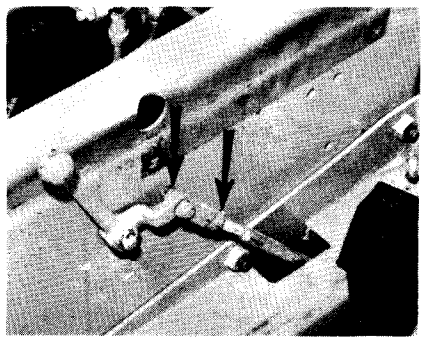
2. Lubricate 1 fitting on each side of cable control. Total 2 fittings.

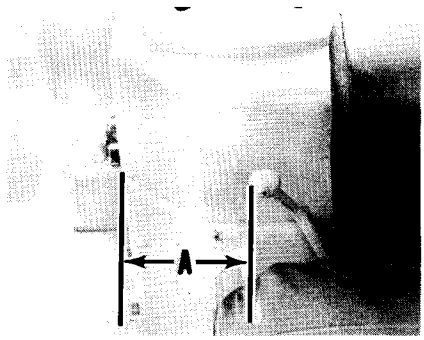
⑯ PARKING BRAKE LEVER



Check to see that parking brake lever engages properly. If it does not, adjust lever linkage.

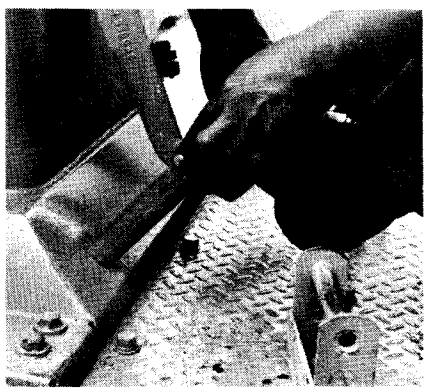
To Adjust:





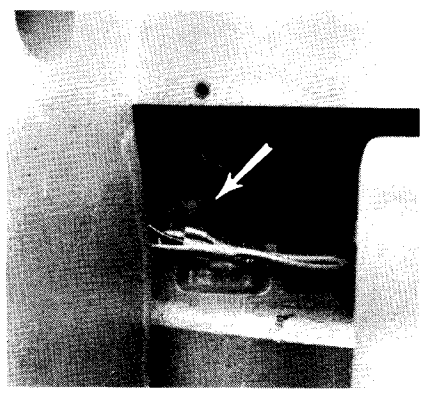
Disengage brake lever. Disconnect lever. Loosen nut and adjust length of rod so that dimension "A" is 4 inches (101,6 mm). Tighten nut and connect lever. If tractor is not equipped with a console,lever should be 3.5 inches (88,9 mm) from front edge of seat frame.

⑰ STEERING CLUTCH BRAKES

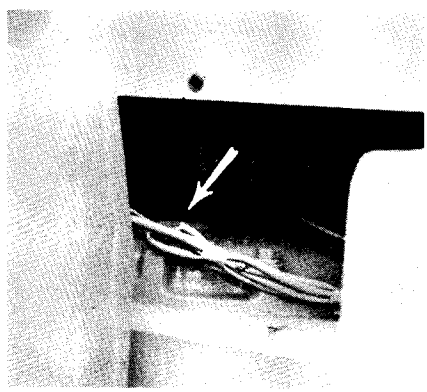


Check adjustment. Adjust brakes when pedal travel reaches 6 to 6½ inches (150 to 165 mm).

To Adjust:

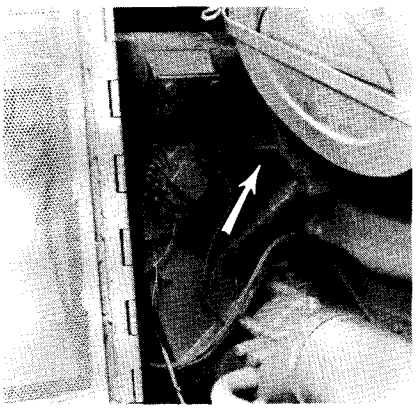


1. Remove guard and cover.

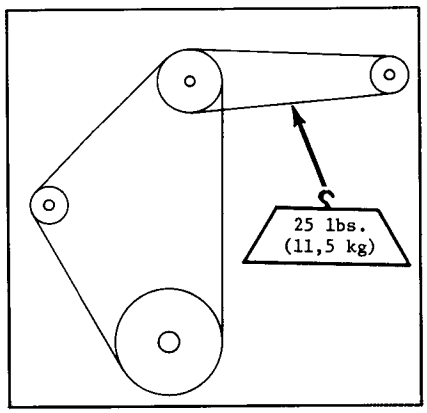


2. Turn adjusting screw in until tight (brake band tight against brake drum). Back screw out 1½ turns (9 clicks).

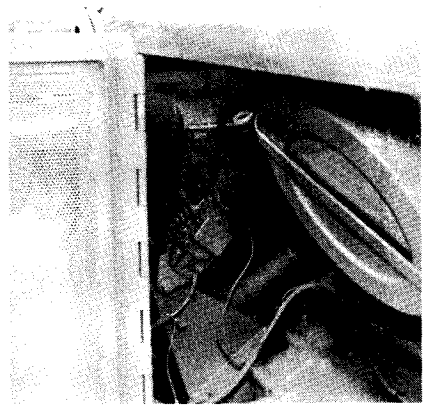
⑱ FAN AND ALTERNATOR BELTS



1. Check condition of belts. Always install a matched set of belts when any belt requires replacement.



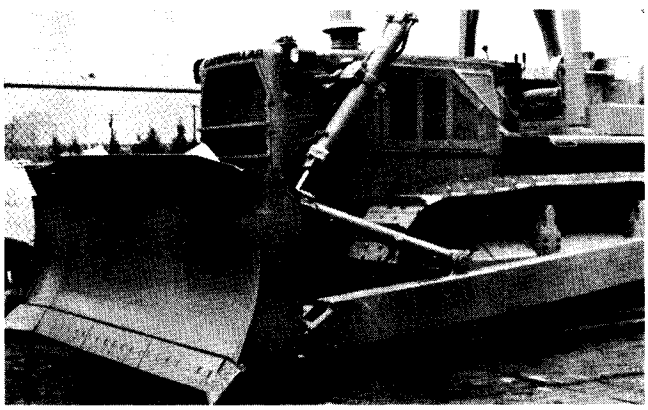
2. Check alternator belt. Correct adjustment allows approximately ¾ inch (19 mm) deflection.



To adjust alternator belt: Loosen mounting bolts and move alternator to obtain correct adjustment. Tighten mounting bolts.

EVERY 500 SERVICE HOURS OR 3 MONTHS

⑲ HYDRAULIC CONTROL SYSTEM



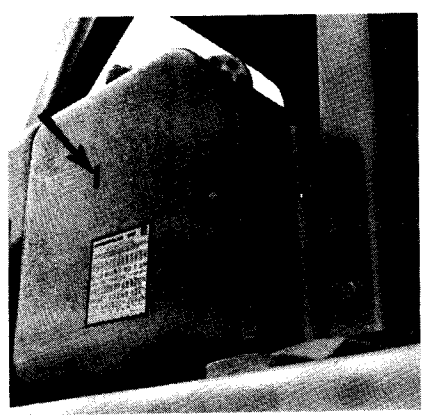
1. Lower all equipment and stop engine.

2. Remove cover and old element.

3. Check cover seal. Install new seal if necessary.

4. Install new element. Install cover.

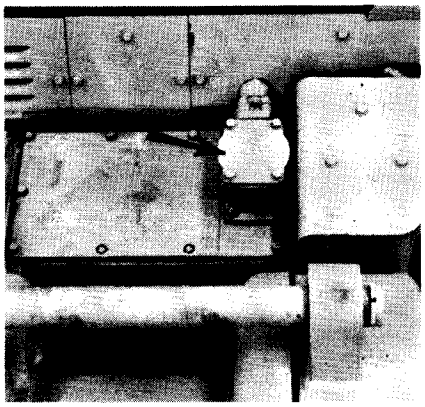
5. Start engine and operate at low idle.



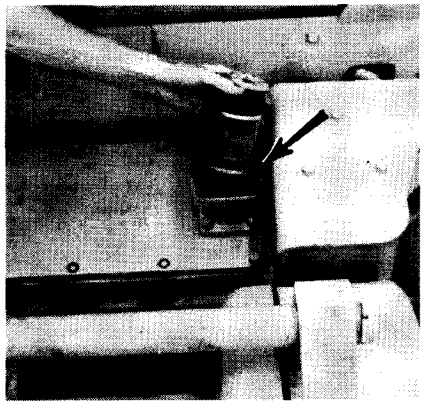
6. Check oil level. Oil should be visible in sight gauge. Add oil as required.

EVERY 500 SERVICE HOURS OR 3 MONTHS

⑳ WINCH MAGNETIC STRAINER

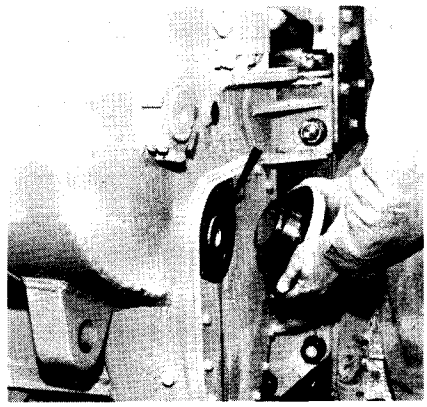


1. Remove cover and strainer. Wash strainer in clean solvent.



2. Install strainer. Inspect seal. Install a new seal if necessary. Install cover.

㉑ WINCH FILTER

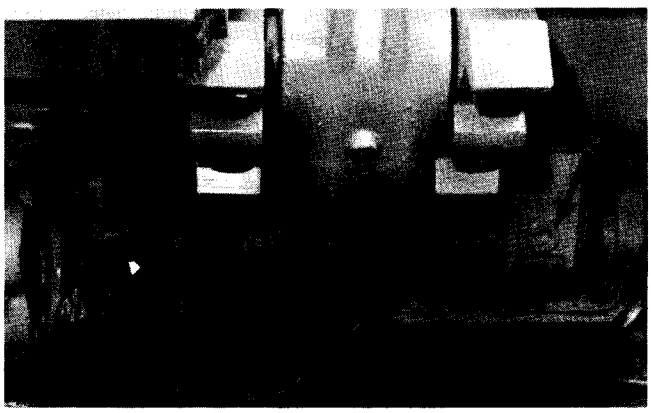


1. Remove cover and filter element. Install new element.

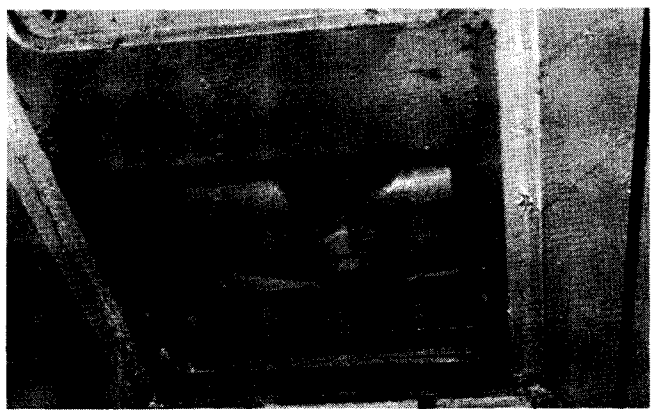
2. Inspect seal. Install a new seal if necessary. Install cover.

EVERY 1000 SERVICE HOURS OR 6 MONTHS

㉒ TRANSMISSION, BEVEL GEAR AND STEERING CLUTCH COMPARTMENT



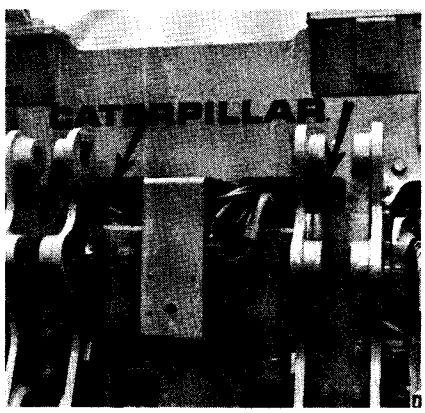
1. Oil should be warm before draining. Remove bevel gear drain plug. Remove steering clutch drain plugs (one each side).



2. Remove converter drain plug.

3. Change filter elements. Wash magnetic strainers. See Item ⑧.

4. Install all drain plugs.

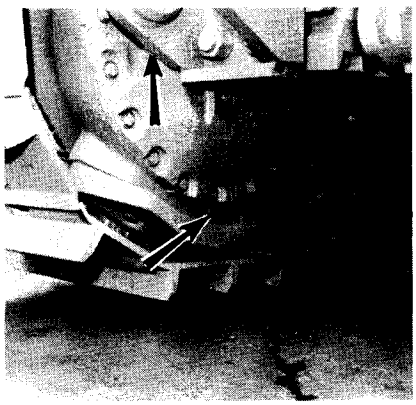


5. Remove 2 breathers and install new ones.

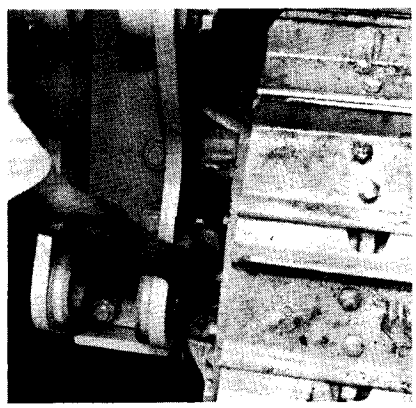
6. Fill compartment. See REFILL CAPACITIES. Start engine and check oil level. Oil should be up to FULL mark on dipstick.

7. Install fill cap.

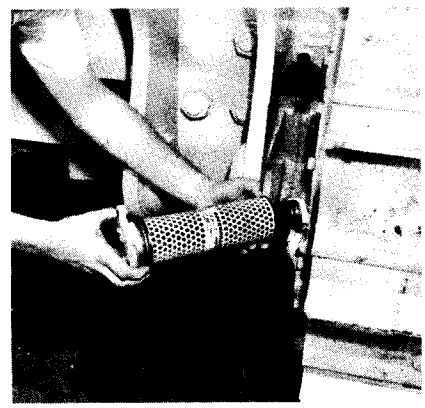
㉓ FINAL DRIVES



1. Remove fill and drain plugs (one each side) and allow oil to drain.



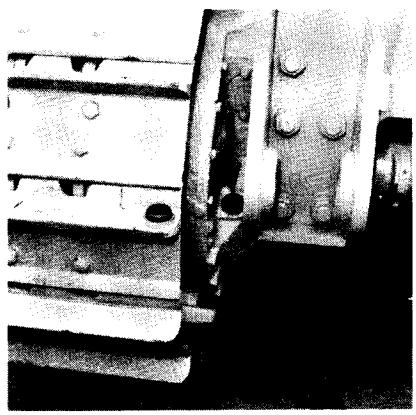
2. Remove covers and filter elements.



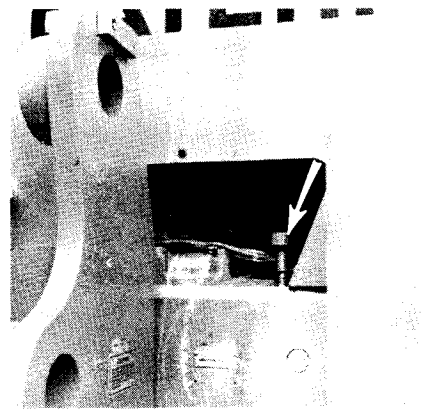
3. Remove old elements from covers and install new elements on covers.

4. Check seal. Use new one if necessary.

5. Install new filter elements and covers.

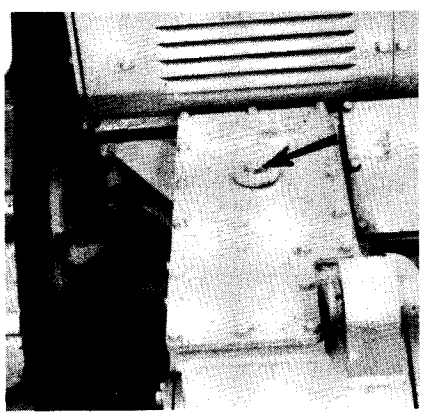


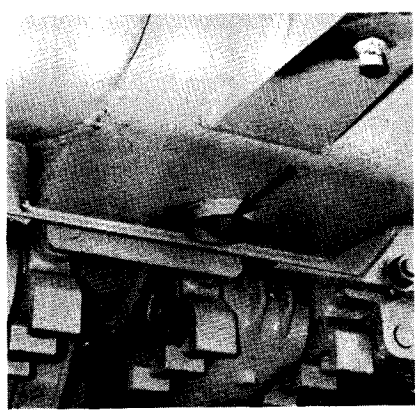
6. Install drain plugs and fill compartment. See Refill Capacities. Install fill plugs.



7. Remove and discard breather. Install new breather.

㉔ WINCH OIL SUMP



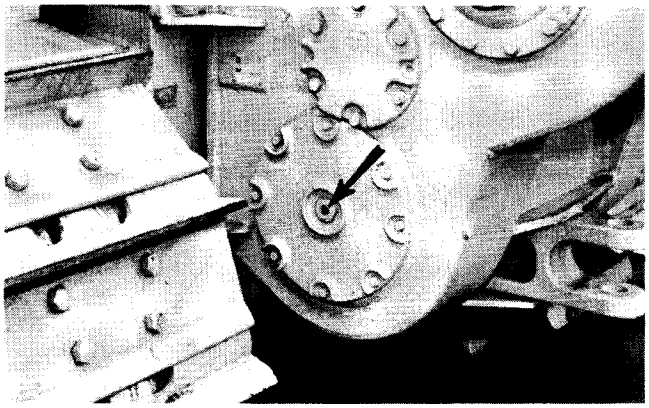


1. Remove fill and drain plugs. Allow oil to drain. Do items ⑳ and ㉑.

2. Clean and install drain plug.

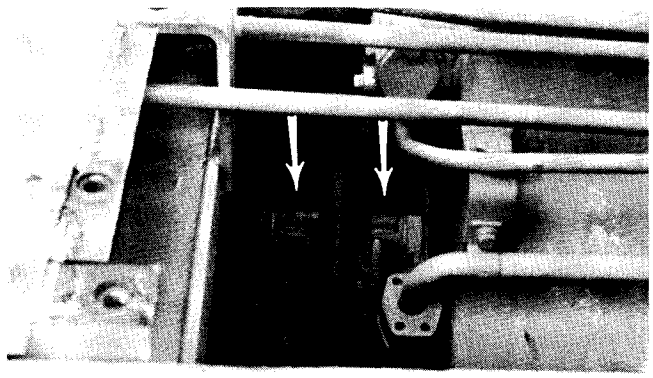
3. Fill compartment until oil is visible in the sight gauge. See REFILL CAPACITIES. Clean and install fill plug.

EVERY 1000 SERVICE HOURS OR 6 MONTHS



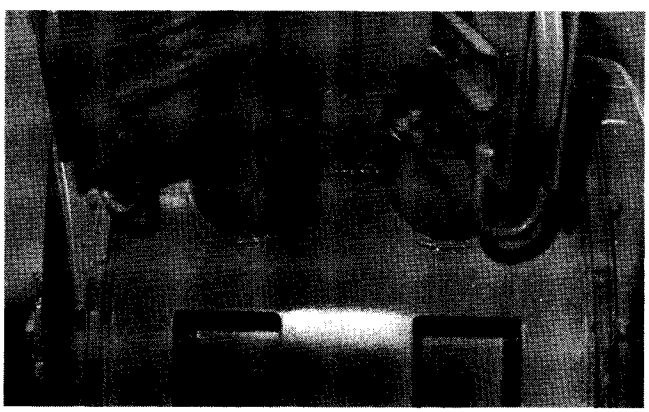
4. Start engine and operate at low idle. Check oil level with engine running at low idle. Oil level must be visible in sight gauge.

㉕ UNIVERSAL JOINT



Remove floor plate and lubricate 2 fittings.

㉖ CABLE CONTROL FAIR-LEAD SHEAVE LOWER BEARINGS

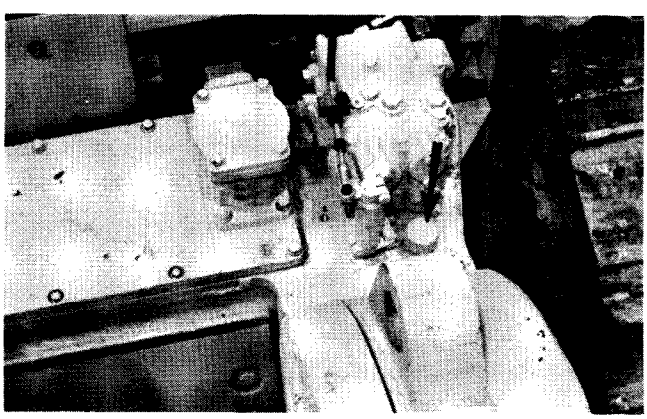


Remove plugs and install 2 fittings. Lubricate 2 fittings, remove fittings and install plugs.

㉗ CABLE CONTROL

Remove breather. Wash in clean solvent. Lightly oil element and install breather.

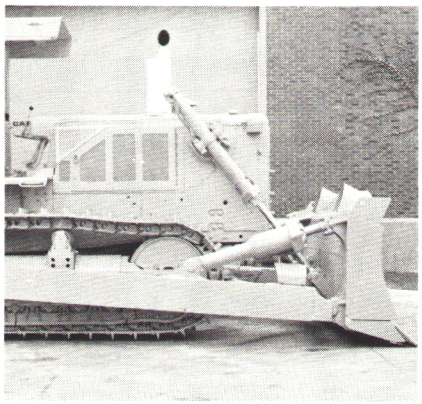
㉘ WINCH BREATHER



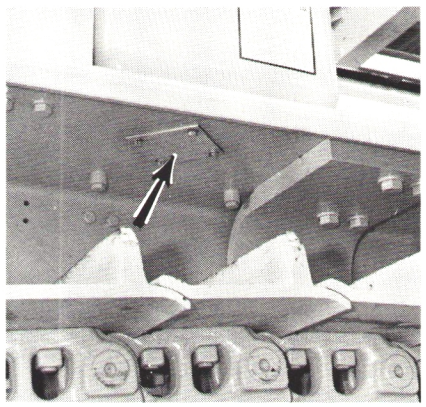
Remove and discard breather. Install a new breather.

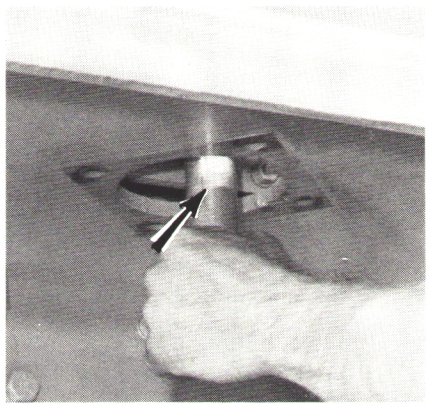
EVERY 2000 SERVICE HOURS OR 1 YEAR

㉙ HYDRAULIC CONTROL SYSTEM



1. Position tractor on level ground. Lower all equipment.



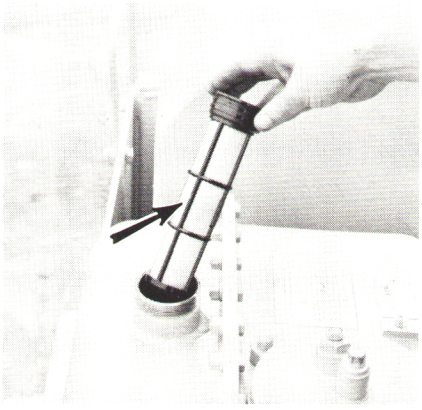


2. Stop engine and remove fill plug. Remove plate under fender and remove drain plug. (Insert a 1 inch (25,4 mm) pipe nipple, approximately 6 inches (152 mm) long, into drain to relieve check valve. Allow oil to drain.

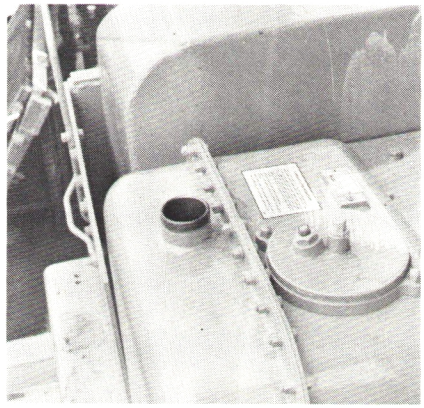
⚠ WARNING
Extreme caution should be used, oil can be hot and may cause personal injury.

3. Remove pipe nipple and install drain plug and plate.

4. Change filter element. See Item 19.

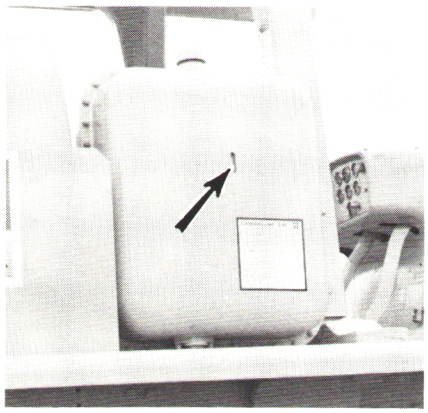


5. Remove filler strainer. Wash strainer in clean solvent. Install strainer.



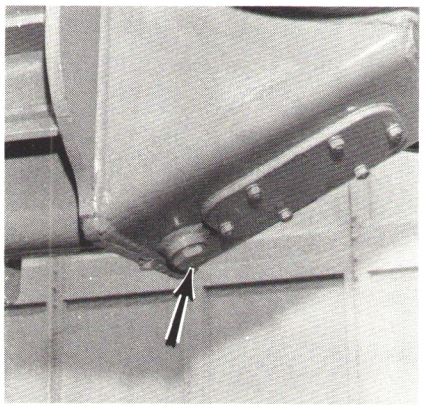
6. Add oil to tank until it is visible in sight gauge. See REFILL CAPACITIES.

㉚ CABLE CONTROL GEAR CASE



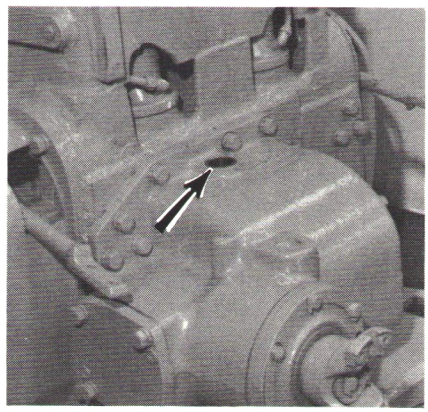
7. Check oil level.

8. Clean and install filler cap.



1. Remove fill and drain plugs. Allow oil to drain.

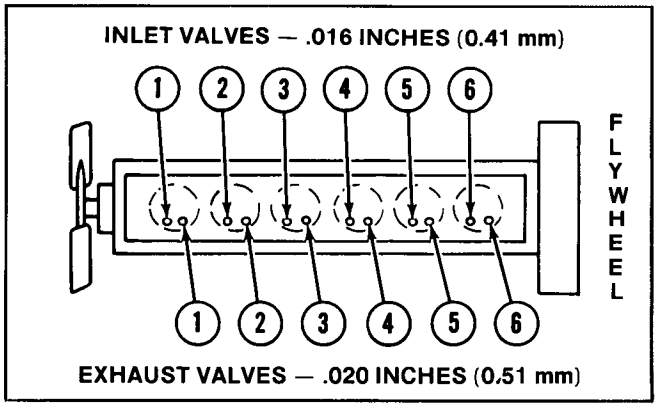
2. Clean and install drain plug.



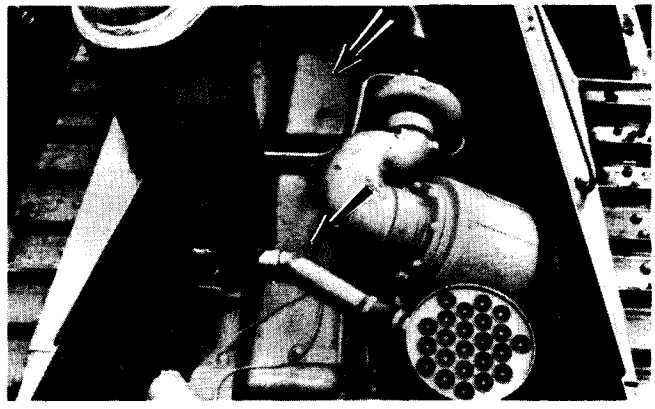
3. Fill gear case with oil to level of fill plug opening. Install fill plug. See REFILL CAPACITIES.

EVERY 2000 SERVICE HOURS OR 1 YEAR

㉞ ENGINE VALVE LASH

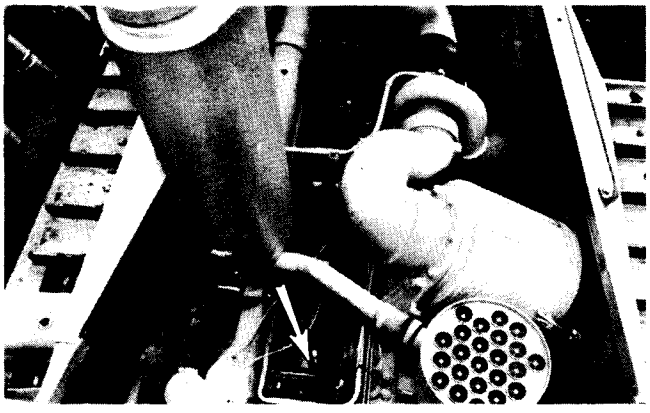


Check valve lash with engine stopped.

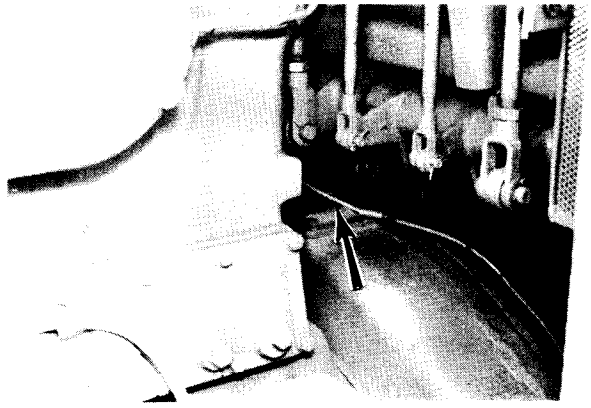


1. Remove valve covers.

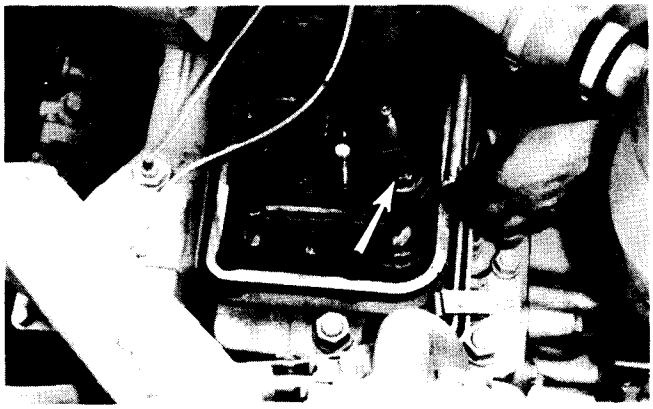
CAUTION
Always turn flywheel in direction of normal rotation.



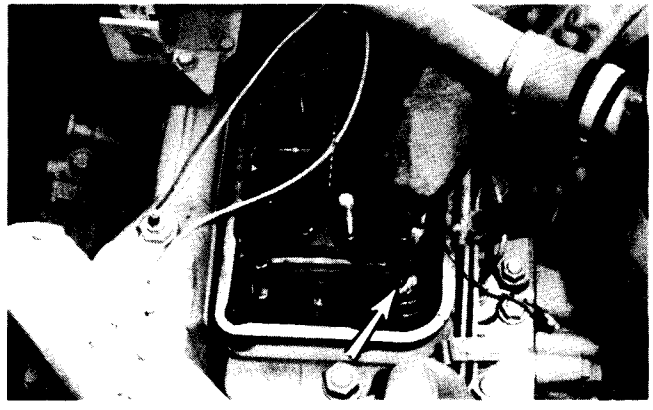
2. Turn flywheel to close No. 1 exhaust and inlet valves.



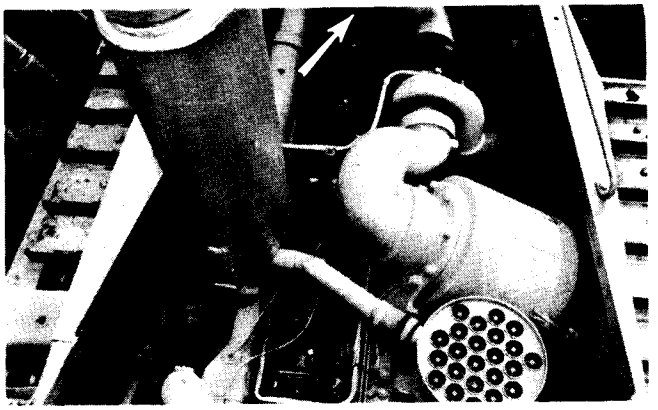
3. Remove cover at the top of the flywheel housing. Indicator should be aligned with the TDC mark on flywheel.



4. Check valve lash for No. 1, No. 3 and No. 5 exhaust valves. Adjust if necessary. See page 24.

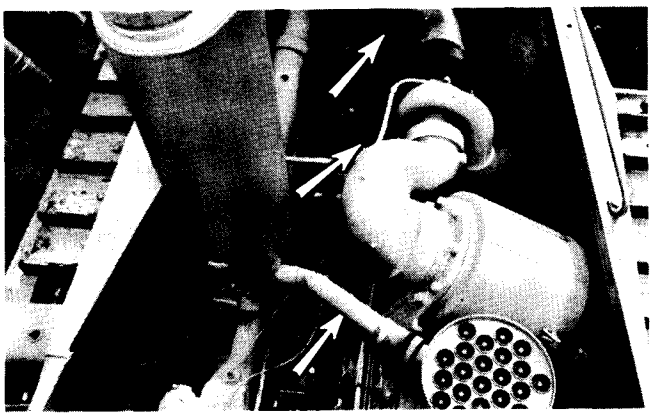


5. Check valve lash for No. 1, No. 2 and No. 4 inlet valves. Adjust if necessary.

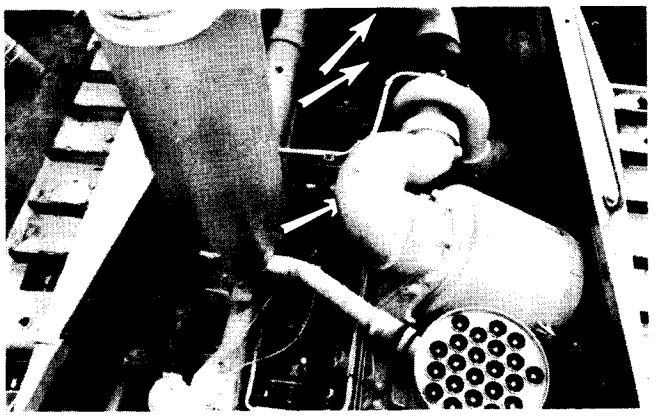


6. Rotate flywheel 360° to close No. 6 exhaust and inlet valves.

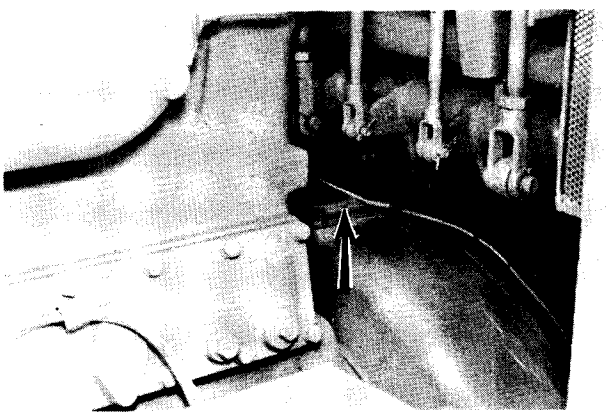
7. Use indicator to assure flywheel is in the correct position.



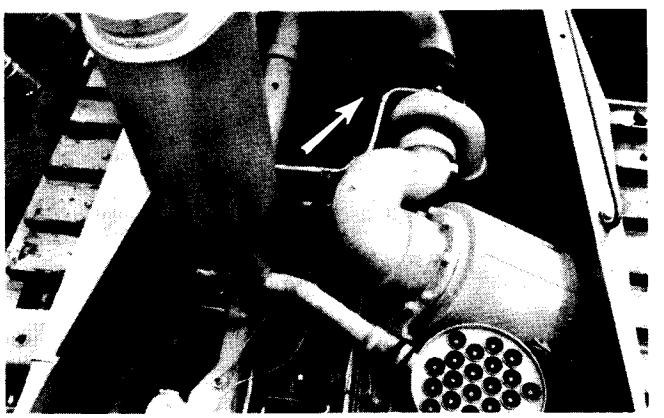
8. Check valve lash for No. 2, No. 4 and No. 6 exhaust valves. Adjust if necessary.



9. Check valve lash for No. 3, No. 5 and No. 6 inlet valves. Adjust if necessary.

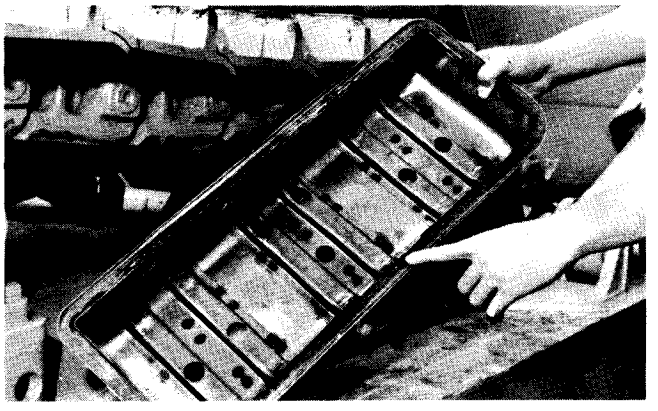


10. Install plate at top of flywheel. Start engine and operate at low idle.

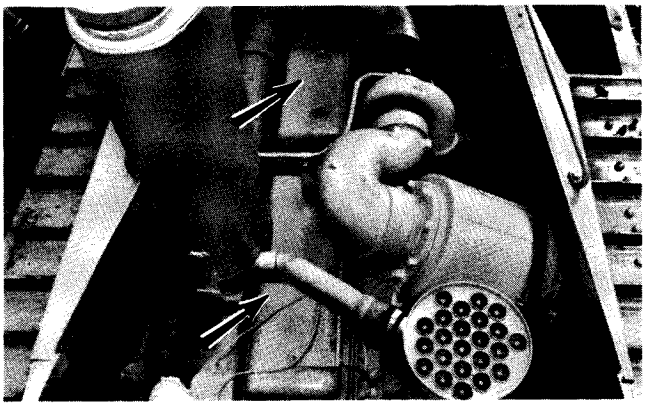


11. Check valve rotation. If valves do not rotate, see your Caterpillar dealer.

EVERY 2000 SERVICE HOURS OR 1 YEAR

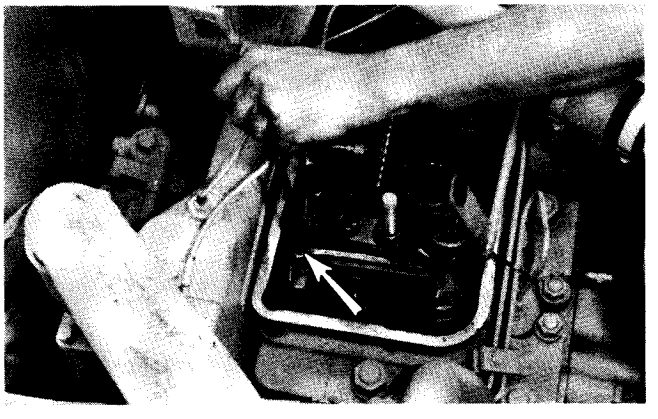


12. Stop engine. Inspect cover gasket, replace if necessary.

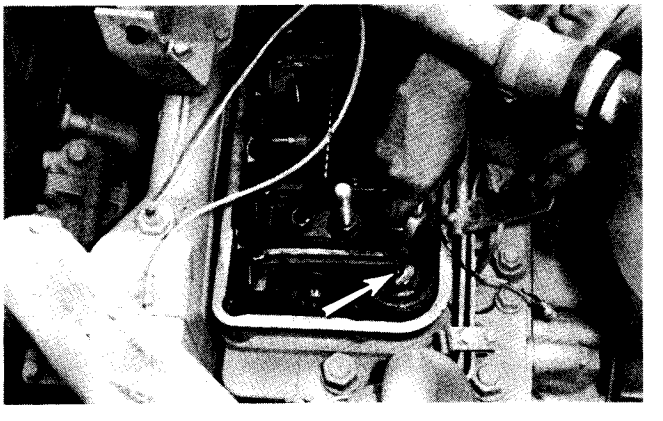


13. Install valve covers, tighten nuts to approximately 25 lb. ft. (3.5 mkg).

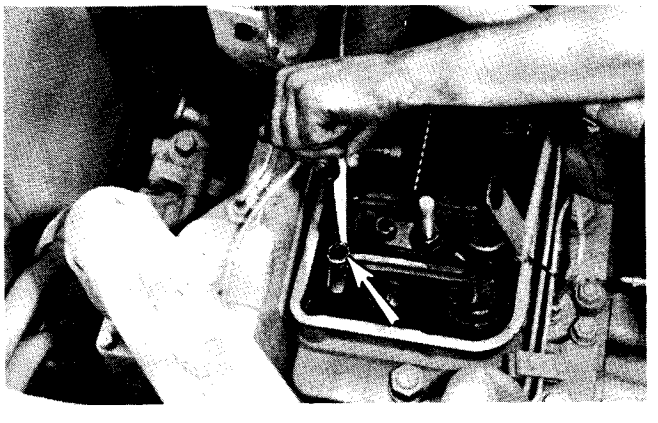
Adjusting Valve Lash



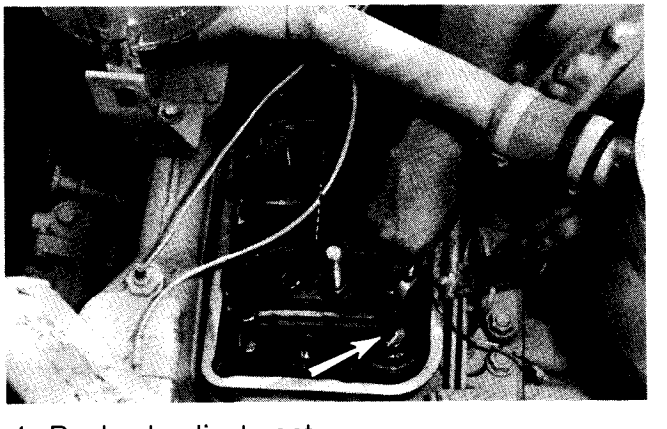
1. Loosen locknut and turn adjusting screw.



2. Check adjustment.



3. Tighten locknut.



4. Recheck adjustment.

㉜ COOLING SYSTEM — Changing Antifreeze Solution[1]

NOTE

When permanent antifreeze and water solutions are used in the cooling system, the solution should be drained and replaced every 2000 hours, or yearly.

When additions of inhibitor are made to the cooling system every 500 hours, or three months, it is not necessary to drain and refill yearly.

Whenever draining and refilling the cooling system, always recheck the coolant level when the engine reaches normal operating temperature.

Use clean water that is low in scale forming minerals — not softened water.

Check specific gravity of antifreeze solution frequently in cold weather to assure adequate protection.

Add Caterpillar Corrosion Inhibitor. Follow recommendations given on container.

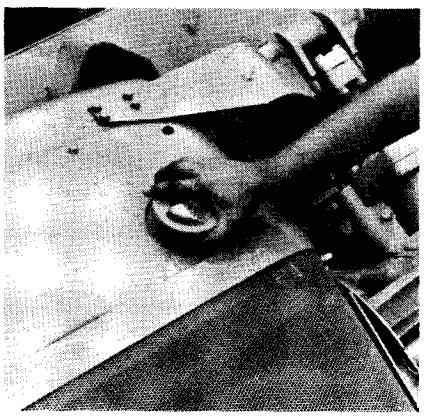
⚠ WARNING

Inhibitor contains alkali, avoid contact with skin and eyes.

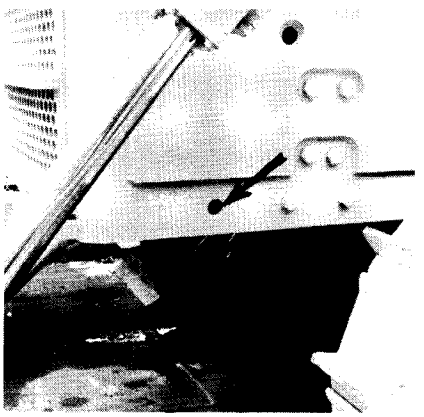
NOTE

The engine cooling system is protected to −20°F (−29°C), with permanent-type antifreeze, when shipped from the factory.

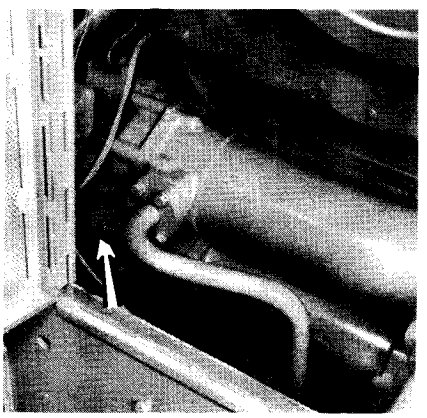
1. Run engine until coolant is at operating temperature. Park machine on level ground and stop engine.



2. Loosen filler cap slowly to release pressure, and remove filler cap.



3. Open radiator drain valve and allow coolant to drain.



4. Remove transmission — engine oil cooler drain plug and allow coolant to drain.

5. If tractor is equipped with a heater, drain coolant from heater.

6. Close radiator valve and install transmission — engine oil cooler plug.

7. Mix antifreeze solution to provide protection to the lowest expected ambient temperature.

8. Add coolant slowly to proper level.

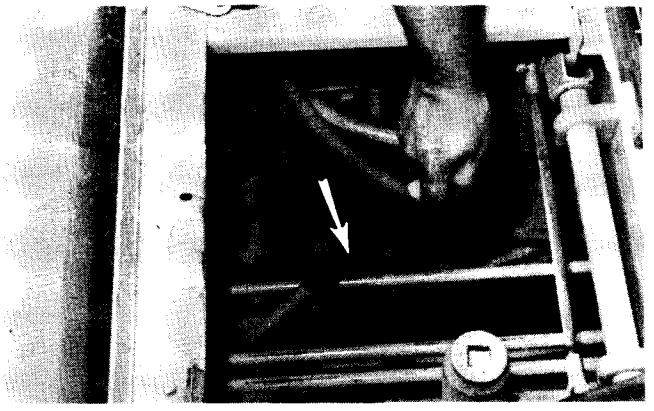
9. Install radiator filler cap.

10. Start machine. Recheck level after operating for a short period.

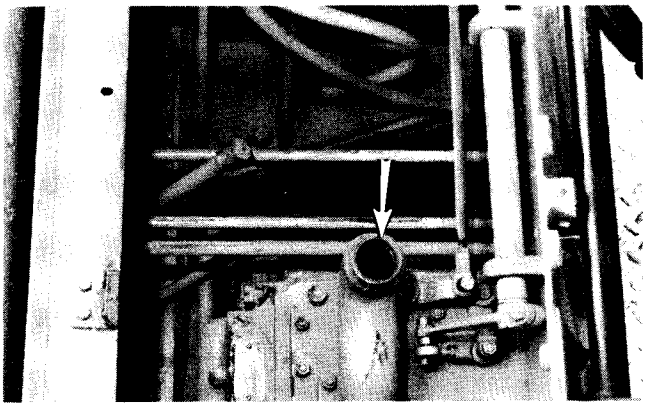
[1]If machine is to be stored in or shipped to an area with below freezing temperatures, cooling system must be drained completely, or protected to lowest expected ambient temperature.

WHEN REQUIRED

㉝ TRANSMISSION, BEVEL GEAR AND STEERING CLUTCH COMPARTMENT



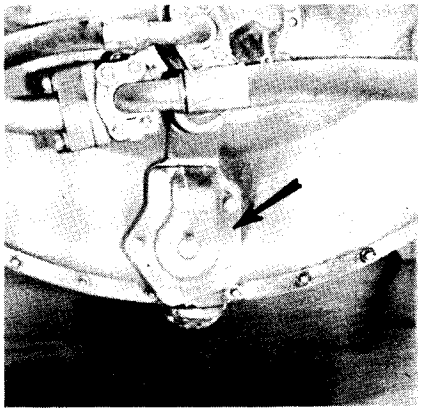
Check oil level with engine at low idle and transmission in NEUTRAL. Maintain oil level between ADD and FULL marks on dipstick.



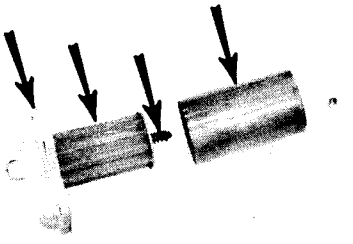
Add oil if required.

㉞ TORQUE DIVIDER SUCTION SCREEN

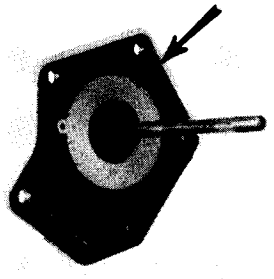
1. Wash suction screen whenever common oil compartment is drained for repairs on brakes, transmission or torque divider.



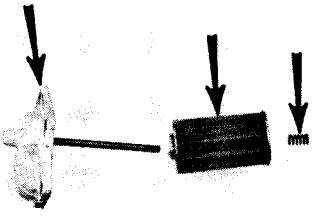
2. Remove cover housing spring and screen.



3. Separate cover, housing spring and screen. Wash screen in clean solvent.



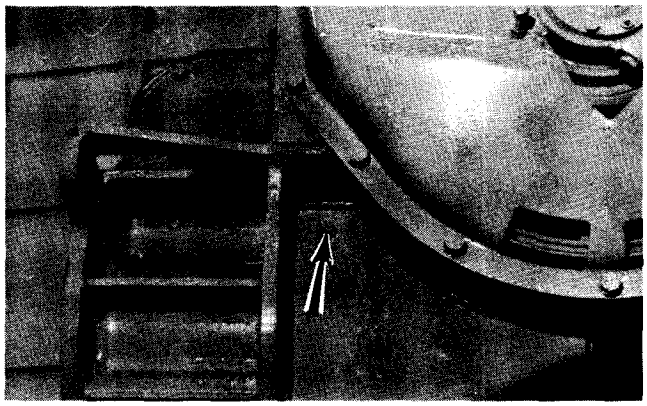
4. Inspect cover gasket. Install new cover gasket if necessary.



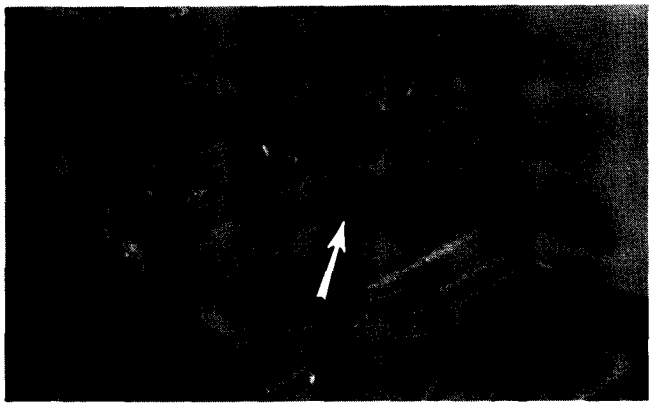
5. Install screen, spring and housing to cover. Be sure pin in housing is aligned with hole in cover.

6. Install suction screen assembly.

㉟ CABLE CONTROL — Checking Oil Level

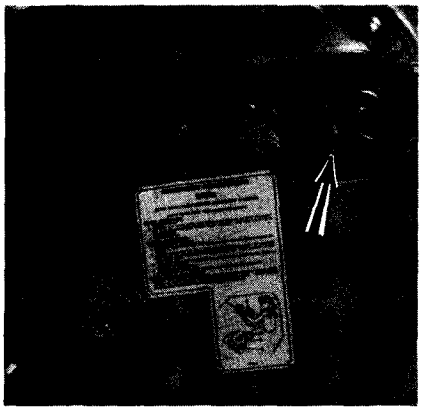


1. Remove check plug.

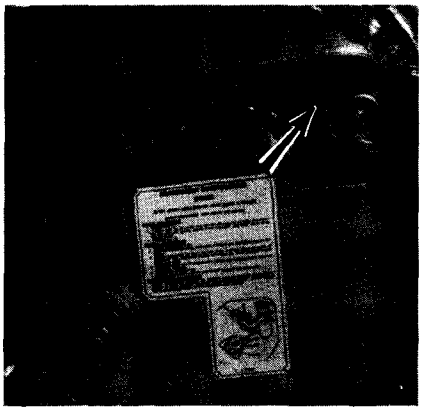


2. Check oil level. Maintain oil level up to the check plug opening. Clean and install check plug.

Brake Adjustment

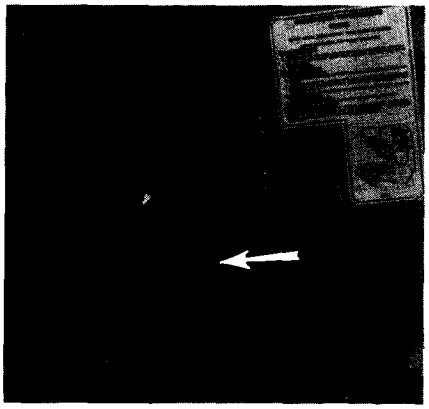


1. Stop engine. Loosen clamp bolt.



2. Turn adjusting nut to align center of roller and small hole in brake lever. Tighten locknut.

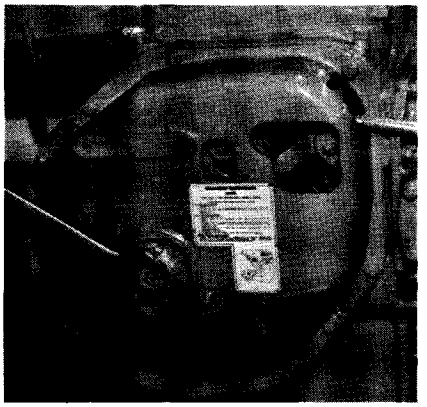
Clutch Adjustment (Adjust brake before adjusting clutch)



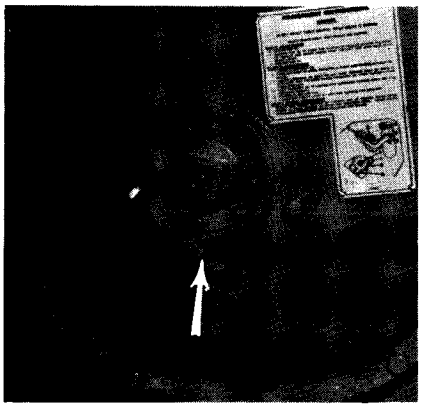
1. Stop engine. Loosen locknut.

2. Turn adjusting screw counter-clockwise until retainer is tight and clutch is engaged.

3. Loosen locknut and turn bolt until it contacts pressure plate retainer. Back bolt out 1 turn.



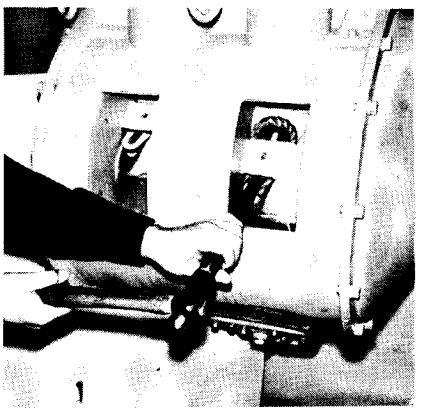
4. Turn adjusting screw until pressure plate retainer contacts bolt. Tighten clamp bolt.



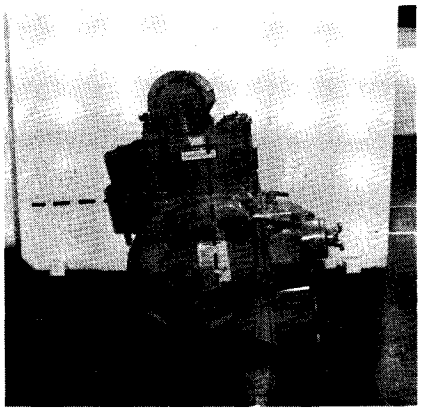
5. Loosen bolt 5 turns. Tighten locknut.

Cable

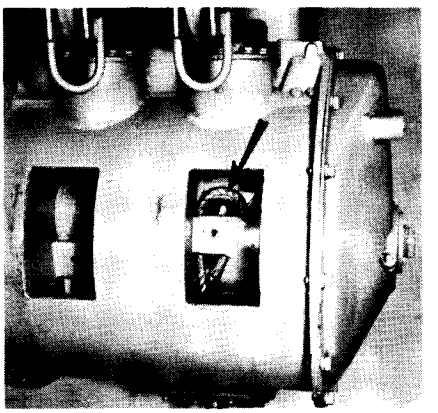
CAUTION
Check cable for frayed or worn spots. If cable is frayed or worn install new cable.



1. Stop engine. Loosen wedge and remove old cable.



2. Thread new cable.

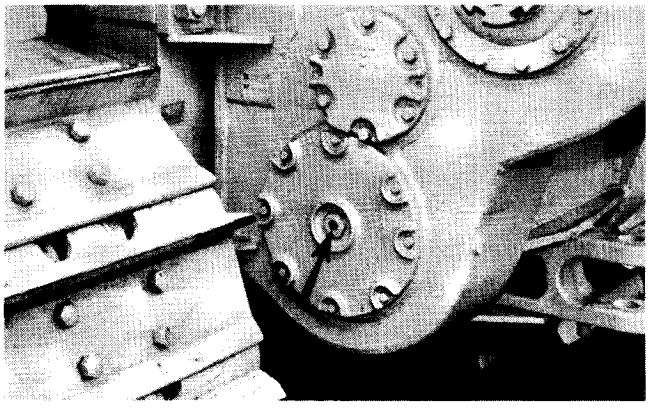


3. Loop end of cable around wedge. Pull cable to tighten wedge.

The recommended cable is: ½", 6 x 25 Filler Wire, Right Lang Lay, Independent Wire Rope Center, Preformed, Improved Plow Steel Type.

MINIMUM AMOUNT OF CABLE ON DRUM		
	RIGHT DRUM	LEFT DRUM
Scraper grounded	5-6 Wraps	
Scraper ejector to rear and apron closed		2 Wraps

㊱ WINCH



NOTE
Check cable. If cable is worn or frayed install a new cable.

1. Check oil level with engine running at low idle. Oil must be visible in sight gauge. Add oil if necessary.

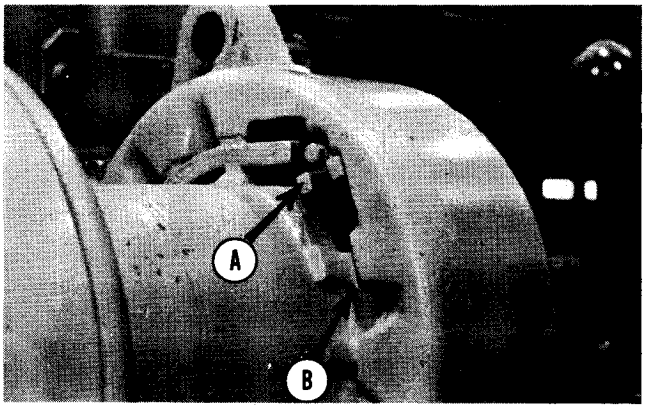
Installing Cable

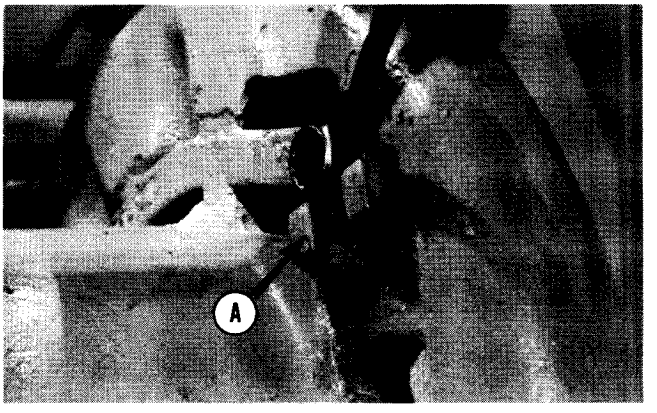
Cable is attached to the drum on the winch with a standard cable ferrule. The ferrule, leaded or wedged to the cable, is fitted into a socket on the drum and secured with a bolt-down clamp.

Ferrules are made in various diameters and lengths. When ordering cable from your local supplier, use the following guide to specify the correct ferrule.

WINCH	CABLE DIAMETER	CABLE FERRULES IN. (mm)		
		Number	Outside Diameter	Length
58	1⅛ (28) 1¼ (32)	J-9 J-10	2⅜ (60) 2⅜ (60)	2¾ (69) 2¾ (69)

NOTE
1¼ in. (32 mm) diameter cable is to be used for extended cable life only. It is not to be used for increasing winch capacity.



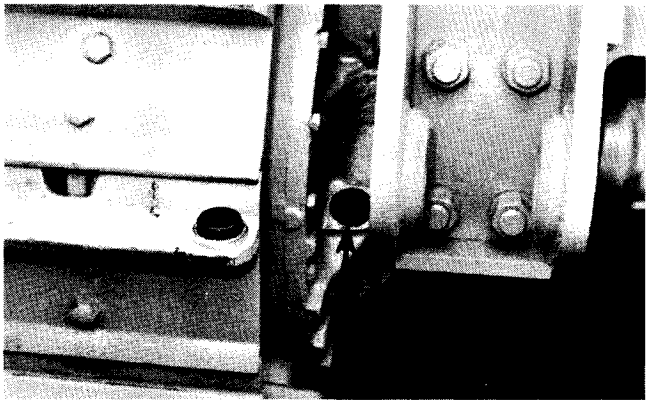


Put the cable in a straight line behind the tractor. Remove clamp (A). Install cable end into groove (B). Install clamp (A).

Spool capacity for the 1⅛ in. (28 mm) diameter cable on the 58 winch with a 13 in. (330 mm) diameter spool is 225 ft. (69 m) or 266 ft. (81 m) with a 9.5 in. (241 mm) diameter spool. Spool capacity for the 1¼ in. (32 mm) diameter cable with a 13 in. (330 mm) diameter spool is 178 ft. (54 m) or 211 ft. (64 m) with a 9.5 in. (241 mm) diameter spool.

WHEN REQUIRED

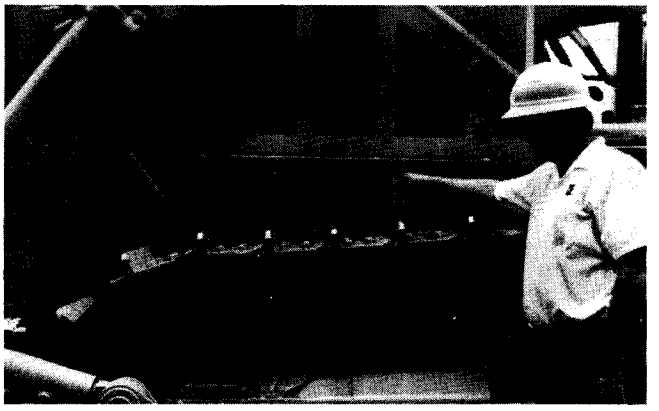
㊲ FINAL DRIVES



1. Remove fill plug.

2. Check oil level. Oil should be up to the filler plug opening. Add oil as required.

㊳ TRACK



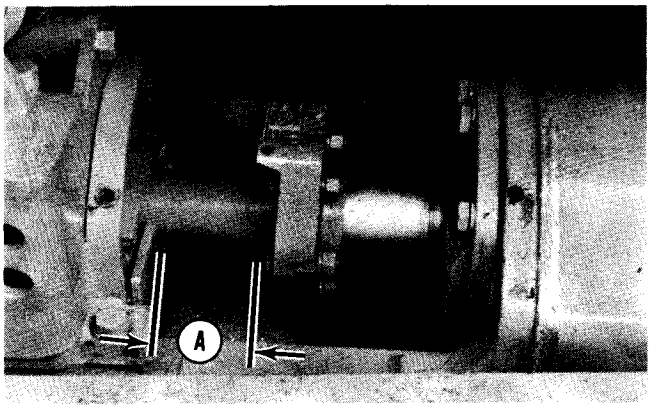
Check adjustment. Correct adjustment allows 1½ to 2 inches (40 to 50 mm) sag at this point.

⚠ WARNING

If track is sealed and lubricated type, secure track with chain before separating links. Sealed and lubricated track is very flexible. When disconnected it can move and cause injury.

If Track is Too Loose:

1. Raise inspection plate and add multipurpose-type grease through fill valve until adjustment is correct.



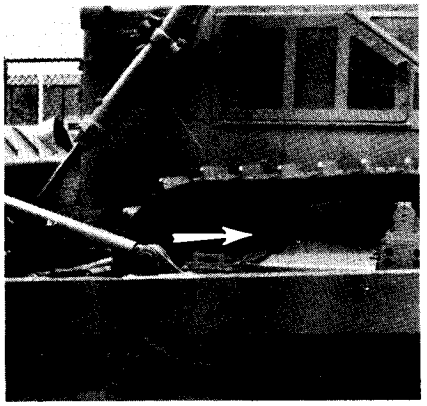
2. Operate tractor back and forth to equalize pressure.

3. Recheck adjustment.

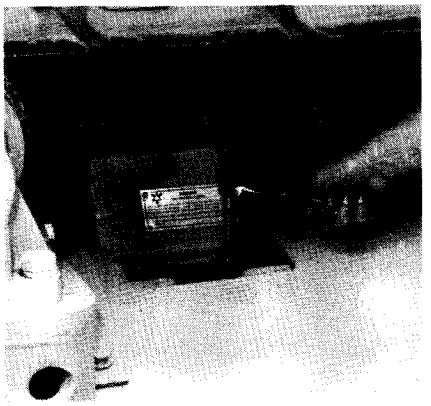
CAUTION

Do not attempt to tighten track when measurement at "A" is less that 1 inch (25 mm). Contact your Caterpillar dealer for track service.

If Track is Too Tight:



1. Be sure front idler can retract. Raise inspection plate.



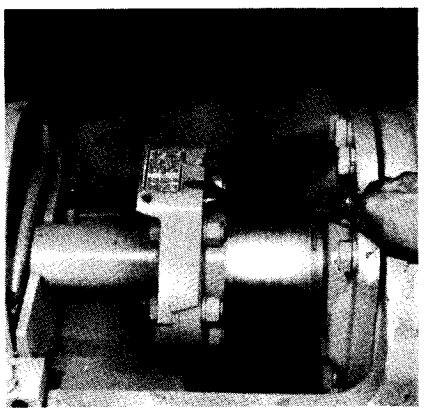
2. Loosen relief valve 1 turn to allow grease to escape.

⚠ WARNING
Never visually inspect relief valve or fill valve to see if grease is escaping. Always observe the track to see if it has loosened.

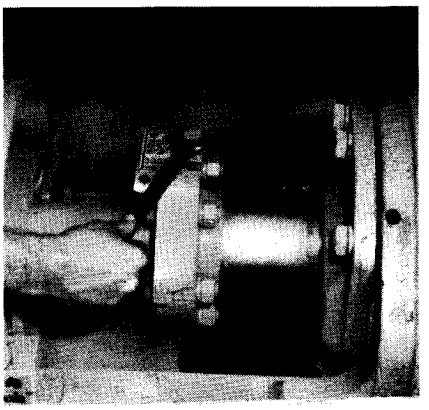
3. Tighten valve when adjustment is correct. Operate tractor back and forth to equalize pressure.

4. Recheck adjustment.

If Track Did Not Loosen:

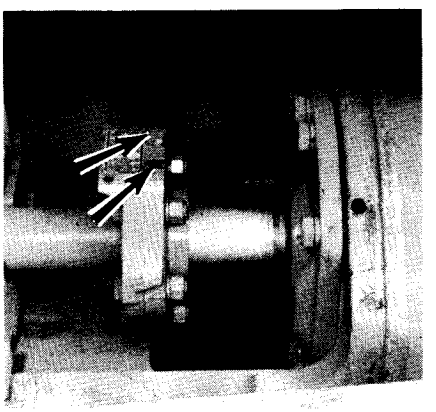


1. Remove guard and loosen fill valve 1 turn. Operate tractor back and forth.



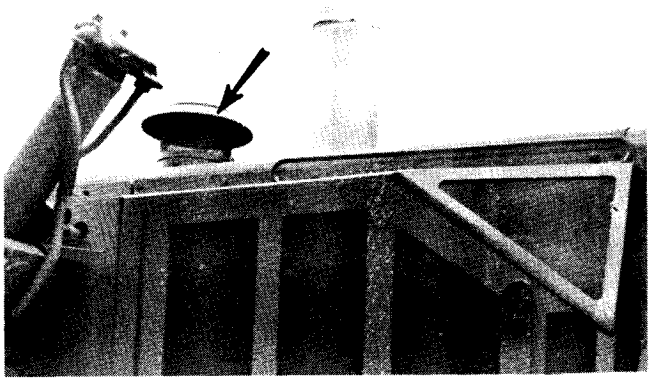
2. Loosen relief valve until it touches guard.

3. Loosen fill valve until it touches guard.



4. Tighten fill and relief valves when adjustment is correct. Contact your Caterpillar dealer if any problems arise.

㊴ PRESCREEN



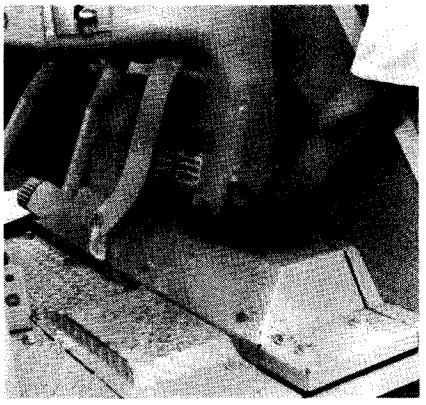
1. Check prescreen for damage and replace if necessary.

2. Wash prescreen in clean solvent, as required, to remove dust and debris on screen.

WHEN REQUIRED

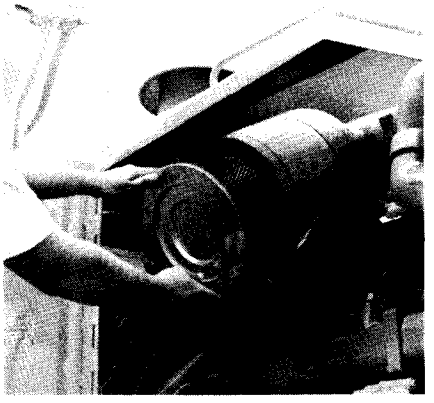
⑩ ENGINE AIR INTAKE SYSTEM

⚠ WARNING
Never service air cleaners with engine running.

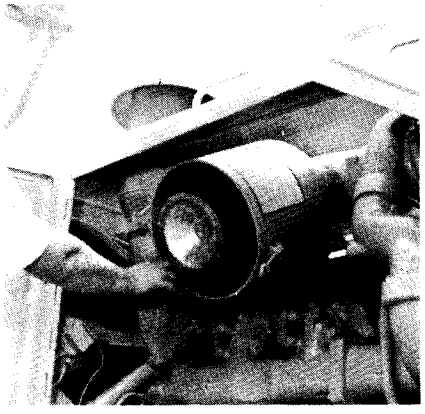


Service filter elements when RED indicator locks in the visible position.

Primary Element



1. Remove cover and primary element.



2. Clean inside of body and cover.

3. Clean and inspect element. (See Page 32).

CAUTION
Always inspect primary element before and after cleaning with a light bulb inside element. Discard if any tears, rips or damage is evident.

4. Install clean element and cover.

5. Reset indicator.

If indicator shows RED shortly after installation of a primary element which has been cleaned approximately 6 times, change to another clean element.

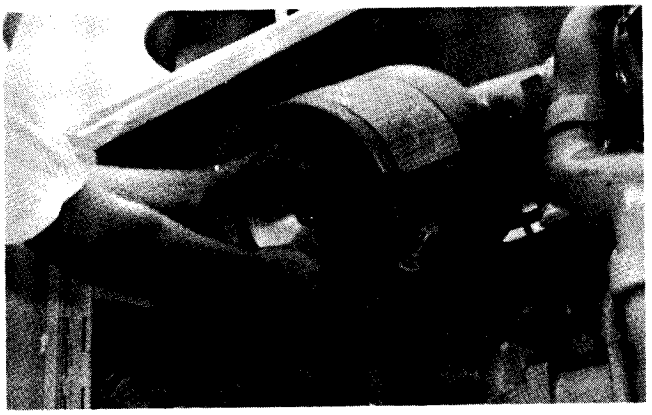
NOTE
The primary element should be replaced after being cleaned a maximum of 6 times. Replace the element once a year even though it has not been cleaned 6 times.

If indicator still shows RED shortly after the installation of the clean primary element, change the secondary element.

Replace the secondary element at the time the primary element is cleaned for the fourth time.

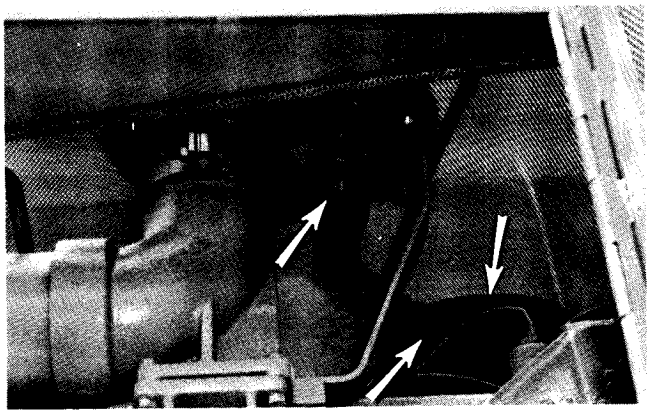
CAUTION
Always replace the secondary element. Do not attempt to reuse by cleaning.

Secondary Element

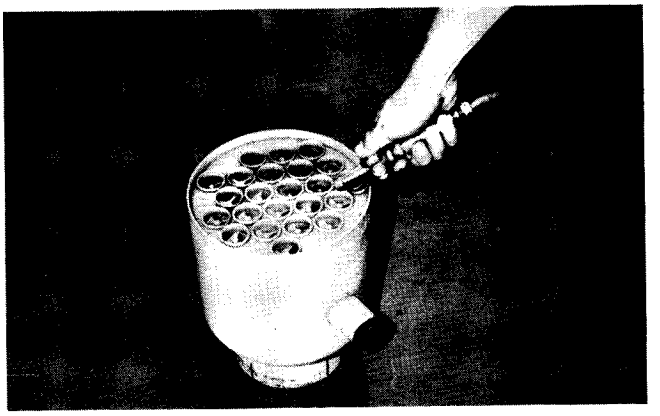


1. Remove cover and primary element.
2. Remove secondary element.

3. Cover air inlet opening. Clean inside of air cleaner body.



4. Inspect precleaner, dust ejector and exhaust venturi. Clean all parts when necessary.

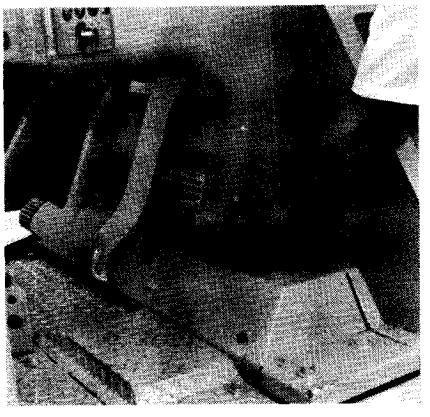


5. Clean parts with compressed air, a stiff fiber brush or wash in water and non-sudsing detergent. Dry all parts before installation.*

6. Uncover air inlet opening.

7. Install secondary element and retainer. Tighten nuts to 20 ± 5 lb. ft. (2,8 ± 0,7 mkg).

8. Install primary element and cover.



9. Reset filter indicator.

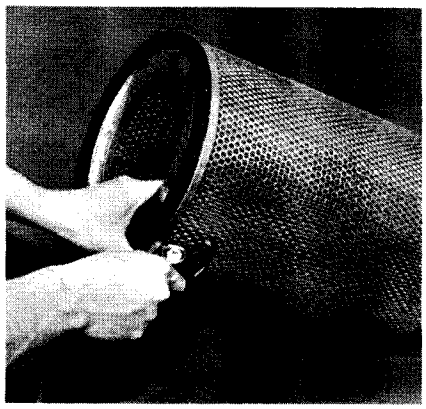
* **⚠ WARNING**
When using pressure air wear safety glasses and protective clothing. Maximum air pressure must be below 30 PSI (2 kg/cm²).

WHEN REQUIRED

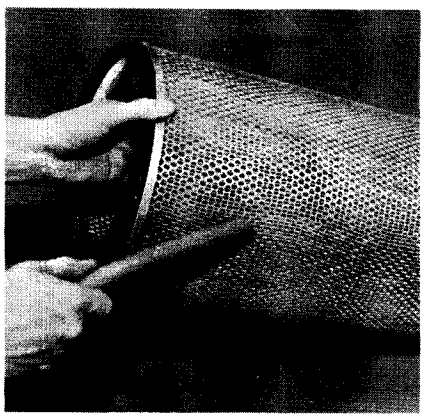
CLEANING AIR CLEANER ELEMENTS

Pressure Air — 30 PSI (2 kg/cm²) Maximum

1. Direct air inside element along length of pleats.

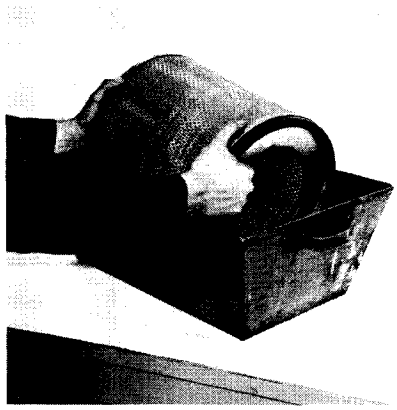


2. Direct air outside along length of pleats. Direct air inside along length of pleats. Check element.



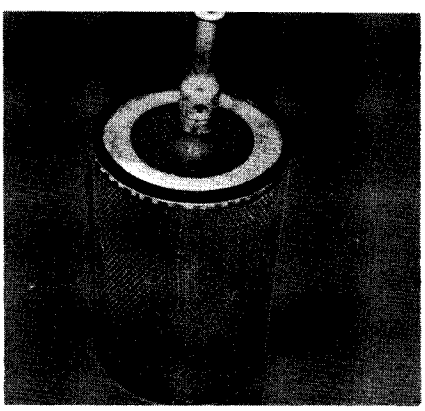
2. Direct water outside along length of pleats. Rinse, air dry thoroughly and check.

Detergent

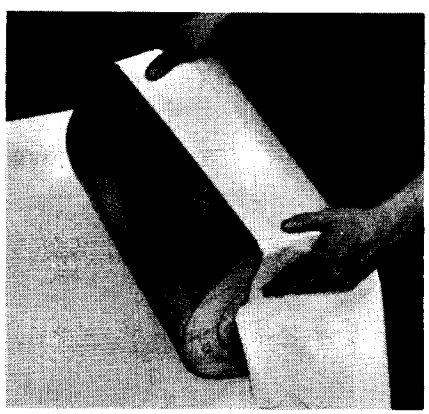


1. Wash in warm water and non-sudsing household detergent.

Checking Element

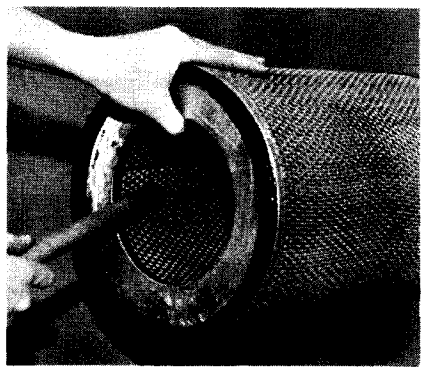


1. Insert light inside clean and dry element and check. Discard element if tears or rips are found.



2. Wrap and store good elements in a clean dry place.

Water — 40 PSI (3 kg/cm²) Maximum



1. Direct water inside element along length of pleats.

2. Rinse with clean water, 40 PSI maximum (3 kg/cm²), see above.

3. Air dry thoroughly and check.

⚠WARNING

When using pressure air for cleaning, wear safety glasses and protective clothing. Maximum pressure should be below 30 PSI (2 kg/cm²).

CAUTION

Do not clean elements by bumping or tapping.

Do not use elements with damaged pleats, gaskets or seals.

NOTE

Have spare elements on hand to use while cleaning used elements.

㊶ COOLING SYSTEM

Whenever draining and refilling the cooling system, always recheck the coolant level when the engine reaches normal operating temperature.

Remove cap slowly to relieve pressure. Maintain coolant level to within ½ inch (1 cm) of the bottom of the fill pipe.

Use clean water that is low in scale forming minerals — not softened water.

Never add coolant to an overheated engine. Allow it to cool first.

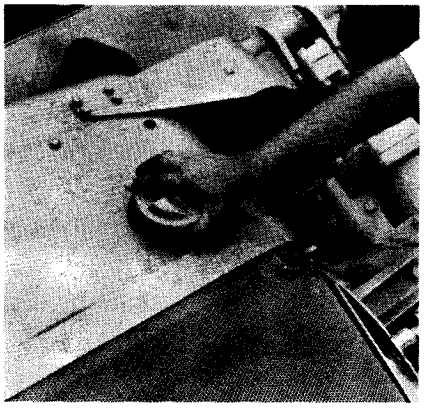
⚠ WARNING
Inhibitor contains alkali, avoid contact with skin and eyes.

Add Caterpillar Corrosion Inhibitor. Follow recommendations given on container.

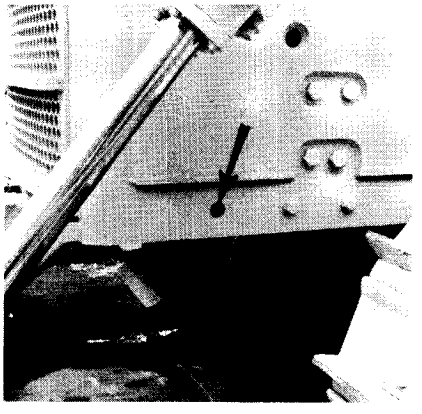
Check specific gravity of antifreeze solution frequently in cold weather to assure adequate protection.

NOTE
If a machine is to be stored, or shipped to an area with below freezing temperatures, refer to item 32 on page 23.

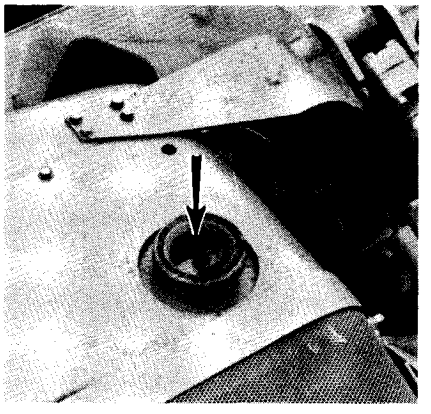
Cleaning Cooling System — Run engine until coolant is warm.



1. Stop engine and loosen filler cap to release pressure. Remove filler cap.



2. Open drain valve and allow system to drain.



3. Close drain valve and fill system with cleaning solution.[1]

4. Start engine and operate for ½ hour.

5. Stop engine and open valve. Flush system with clean water until draining water is clear.

6. Close drain valve and fill system with neutralizing solution.[2]

7. Start engine and operate for 10 minutes.

8. Stop engine, open drain valve and flush system.

9. Close drain valve and add coolant to proper level.

[1] 2 lb. Sodium Bisulphate ($NaHSO_4$) per 10 gal. water (mix 25 grams per 1 liter of water).

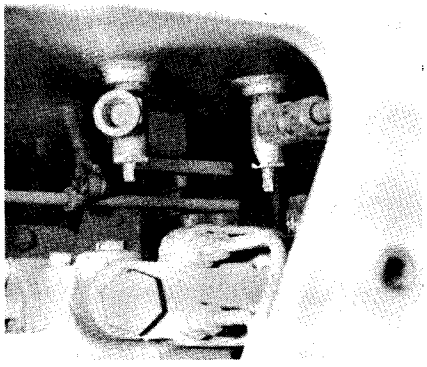
[2] ½ lb. Sodium Carbonate Crystals ($Na_2CO_3 \cdot 10\ H_2O$) per 10 gal. water (mix 6 grams per 1 liter of water).

NOTE
Most commercial type cooling system cleaners may be used.

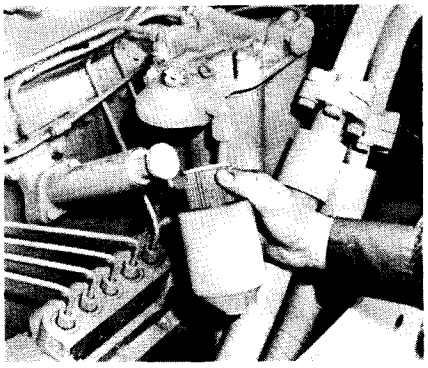
WHEN REQUIRED

㊷ FUEL SYSTEM

Primary Fuel Filter — Clean Element When Fuel Pressure Gauge Registers OUT With Engine Running.



1. Stop engine and close fuel supply valve.



2. Remove case and element. Wash case and element in clean solvent.

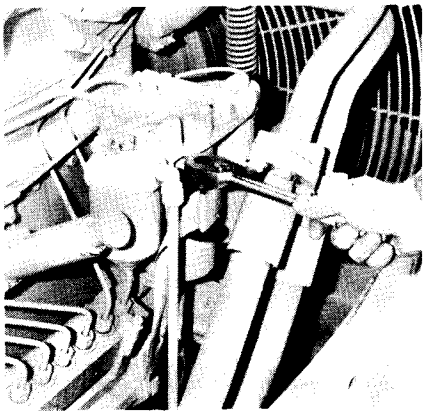
3. Install element and case.

4. Open fuel supply valve.

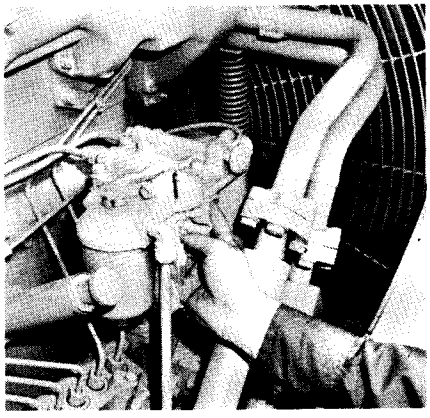
5. Start engine and check for leaks.

NOTE
Change final fuel filters if fuel pressure gauge still registers OUT with engine running.

Final Fuel Filters



1. Stop engine, close fuel supply valve and remove filters.



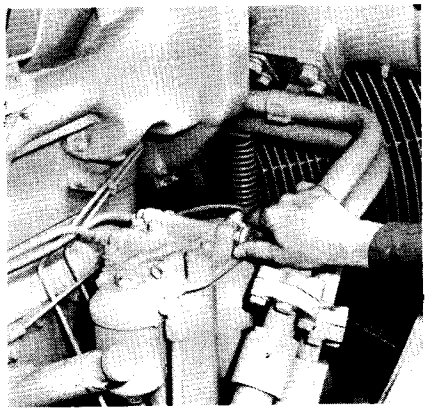
2. Clean filter base. Make sure all of old gasket is removed. Coat gasket of new element with clean diesel fuel.

3. Install new filters. Tighten filters until gasket surfaces contact base, then tighten an additional ½ to ¾ turn.

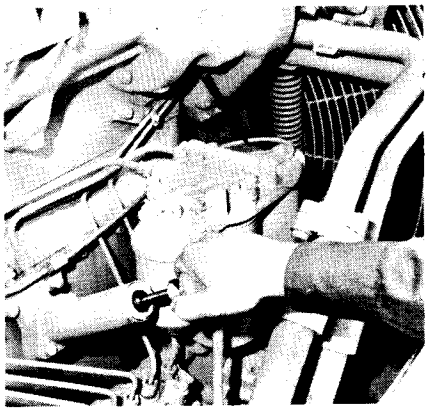
4. Open fuel supply valve and prime fuel system (see below).

5. Start engine and check for leaks.

Priming Fuel System



1. Open bleed valve.

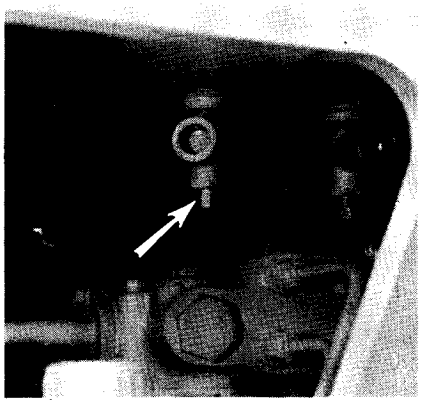


2. Unlock priming pump plunger and operate pump until flow of fuel from drain line contains no air bubbles.

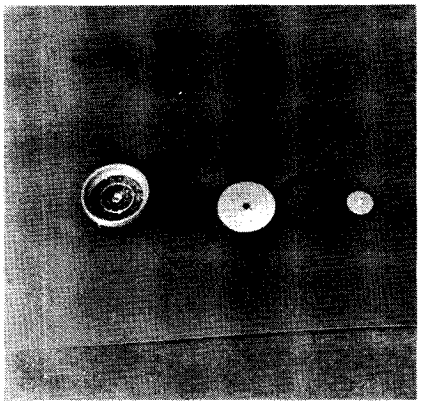
3. Close bleed valve.

4. Start engine and check for leaks.

㊸ DIESEL FUEL TANK AND FILLER CAP

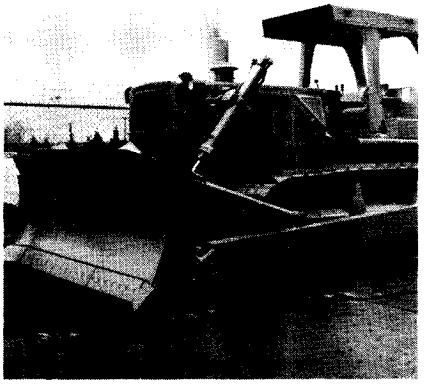


Open drain valve and drain off any sediment or water that may have accumulated.

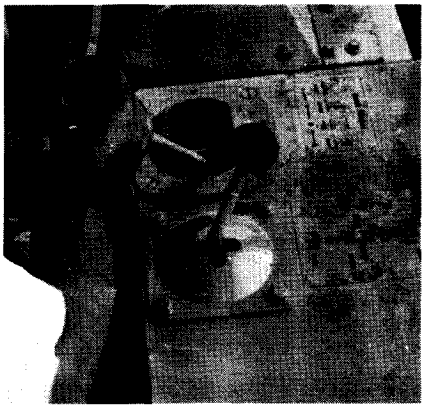


1. Remove and disassemble cap.
2. Wash cap in clean solvent.
3. Oil elements lightly. Assemble and install cap.

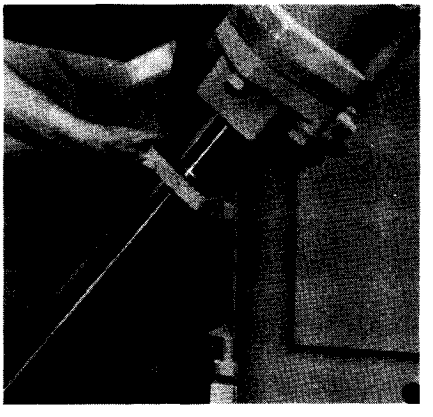
㊹ HYDRAULIC CYLINDERS — Shim adjusted rod packing



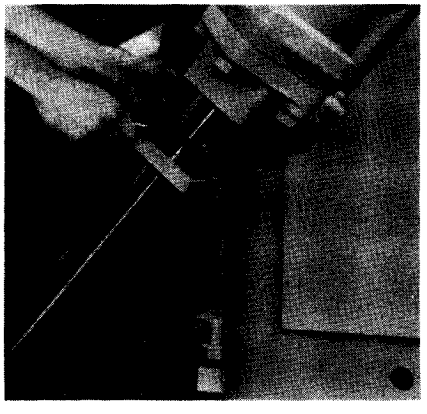
1. Lower blade and stop engine.



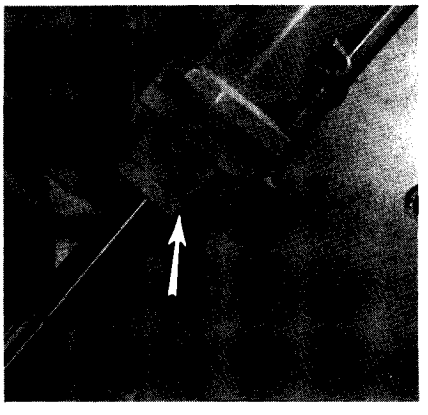
2. Move hydraulic controls to relieve pressure.



3. Remove bolts and slide flange away from cylinder head.



4. Cut and remove 1 shim.

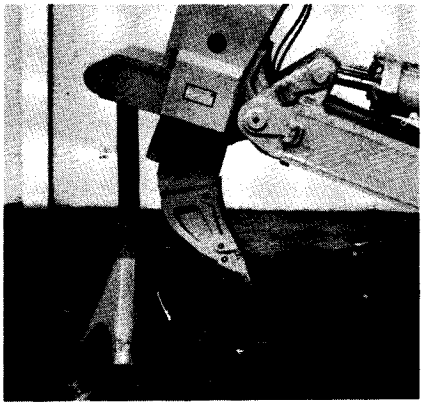


5. Slide flange back and install bolts. Start engine and check for leaks.

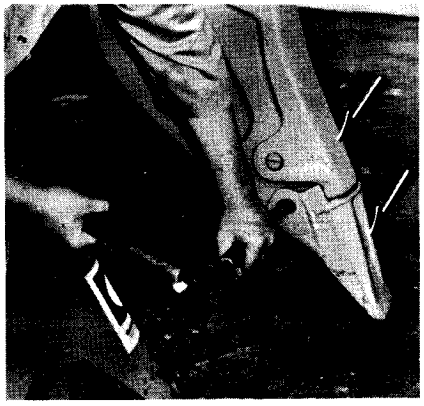
6. If still leaking, remove another shim. Leave at least 2 shims. If packing still leaks, see your Caterpillar dealer.

WHEN REQUIRED

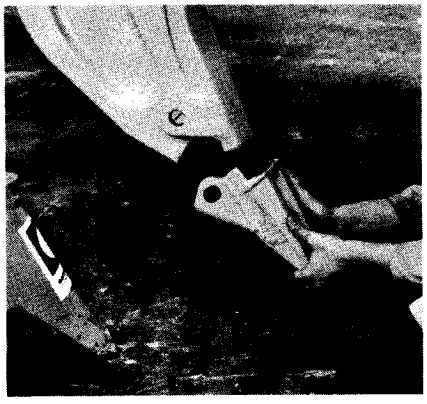
㊺ RIPPER
Protector and Tip



1. Raise and block ripper.

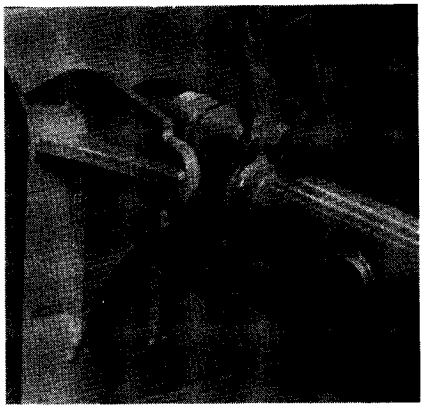


2. Drive pins out, remove protector or tip.
3. Clean pins and shank.



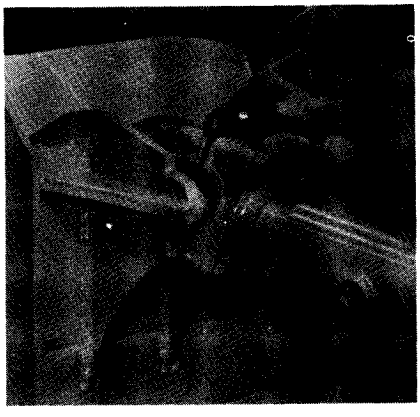
4. Slide new protector or tip on shank and install pins.

㊻ BULLDOZER — Diagonal Arm and Tilt Brace Ball and Socket Adjustment



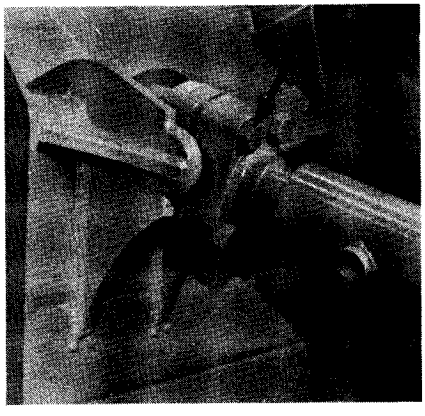
1. Remove cap bolts. Shorten brace and remove shims.

2. Lengthen brace. Install and tighten bolts evenly.



3. Measure clearance between cap and socket with shims.

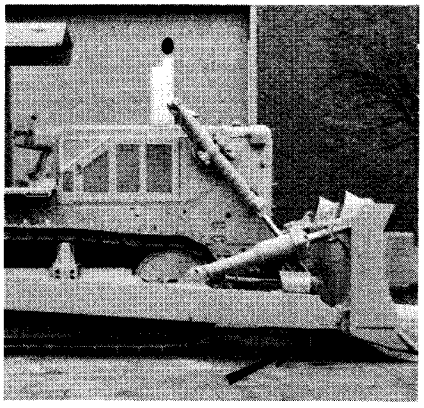
4. Remove bolts and shorten brace. Install shims equal to measured clearance plus 1 shim.



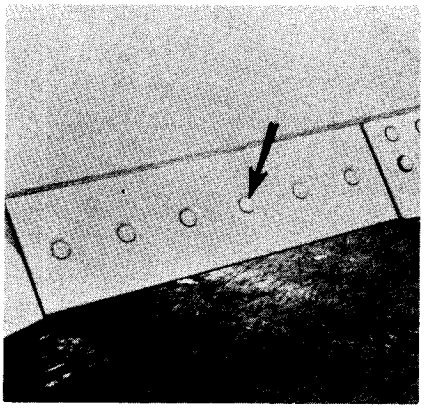
5. Lengthen brace and install bolts.

㊼ CUTTING EDGE AND END BITS

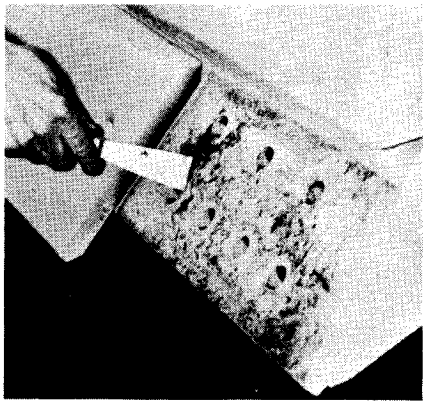
Change cutting edge and use new end bits before wear starts on blade support.



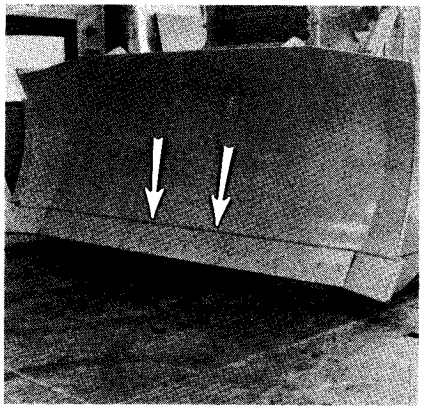
1. Raise and block blade before changing cutting edge or end bits.



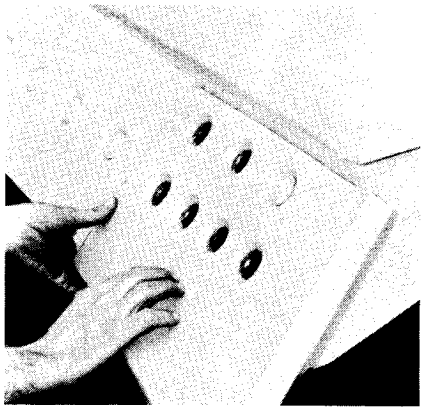
2. Remove bolts.



3. Remove cutting edge or bit. Clean contact surfaces.



4. Use opposite cutting edge if not worn. Use new section if both edges are worn.



5. Use new end bits.

6. Install bolts and tighten to specified torque. (See PLOW BOLT TORQUE CHART).

7. After a few hours of operation retighten bolts to proper torque.

Plow Bolt Torque Chart

BOLT TORQUE VALUES FOR GROUND ENGAGING TOOLS

PLOW BOLT SIZE	RECOMMENDED TORQUE*
5/8 in. (16 mm)	195 ± 25 lb. ft. (27 ± 3.4 mkg)
3/4 in. (19 mm)	350 ± 50 lb. ft. (48 ± 6.9 mkg)
7/8 in. (22 mm)	565 ± 85 lb. ft. (78 ± 11.7 mkg)
1 in. (25 mm)	900 ± 110 lb. ft. (124 ± 15 mkg)

*These values are applicable only to Caterpillar plow bolts.

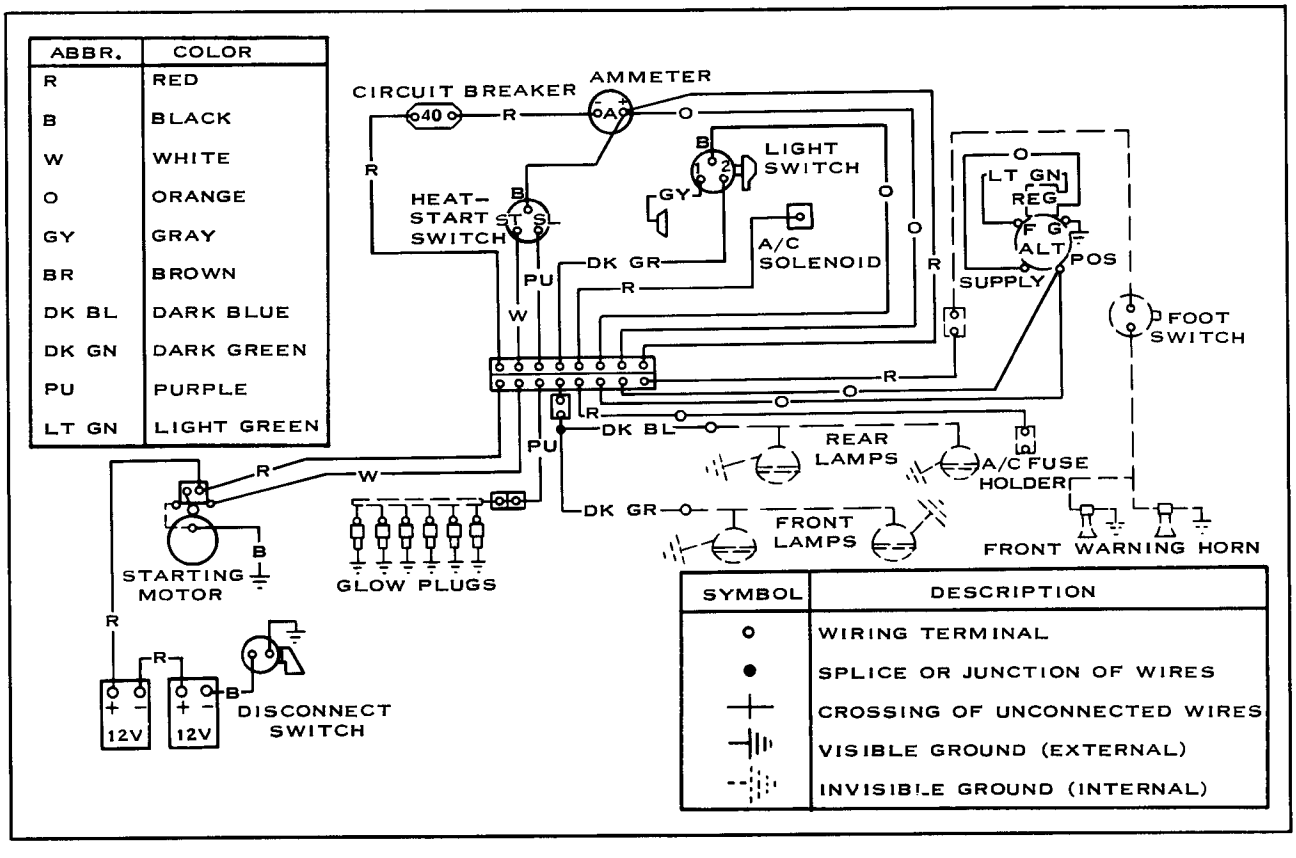
REFILL CAPACITIES (Approximate)

COMPARTMENT OR SYSTEM	U.S. MEASURE	METRIC MEASURE	IMPERIAL MEASURE
Diesel engine crankcase	8.75 gal.	33 ltr.	7.25 gal.
Transmission, bevel gear and steering clutch compartment[1]	31 gal.	117 ltr.	25.75 gal.
Final drives (each)	9.50 gal.	36 ltr.	8 gal.
Cable control gear case	3.75 gal.	14 ltr.	3.25 gal.
Hydraulic system	35 gal.	132,5 ltr.	29.2 gal.
Cooling system	32 gal.	121,2 ltr.	26.7 gal.
Diesel fuel tank	170 gal.	643,5 ltr.	141.6 gal.
Winch oil sump[2]	17 gal.	64,3 ltr.	14.2 gal.

[1]Quantity of oil in transmission may be increased by 10% when operating on severe slopes.
[2]Use same type of oil as used in engine.

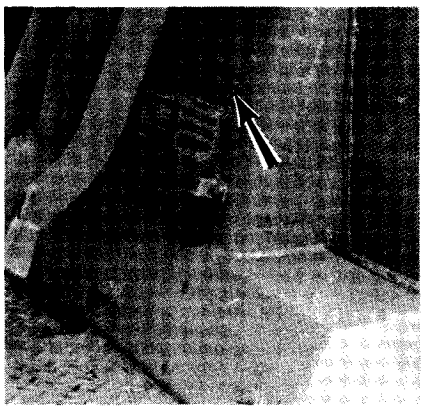
WIRING DIAGRAM

24 VOLT SYSTEM WITH ALTERNATOR

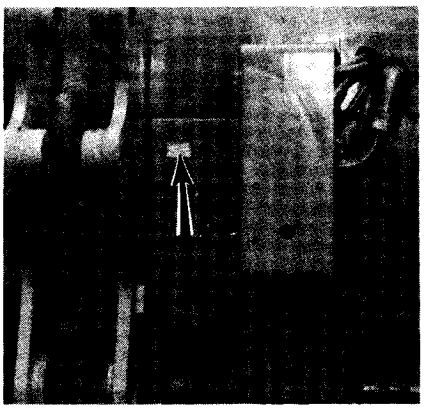


SERIAL NUMBER LOCATIONS

TRACTOR



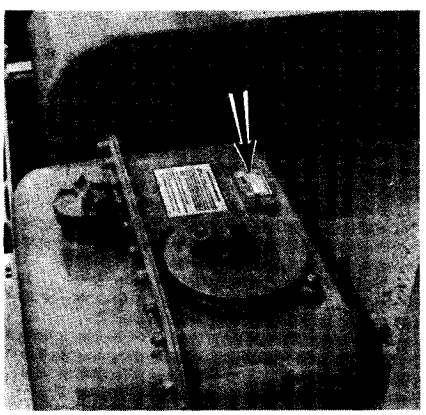
DASH



BEVEL GEAR CASE

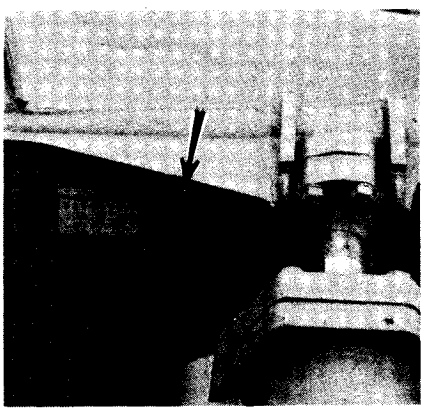
ENGINE

ATTACHMENTS

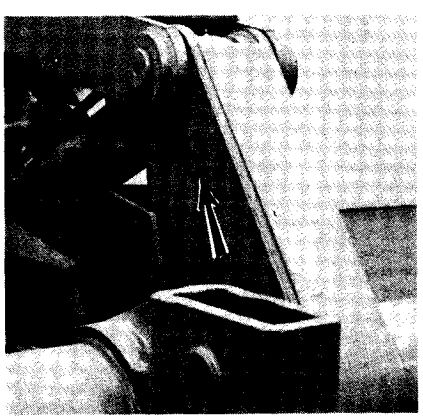


HYDRAULIC CONTROL

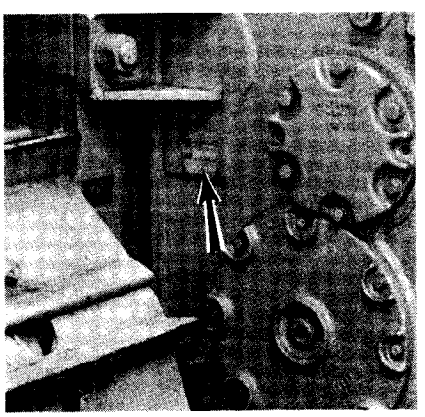
CABLE CONTROL



BULLDOZER



RIPPER



WINCH