

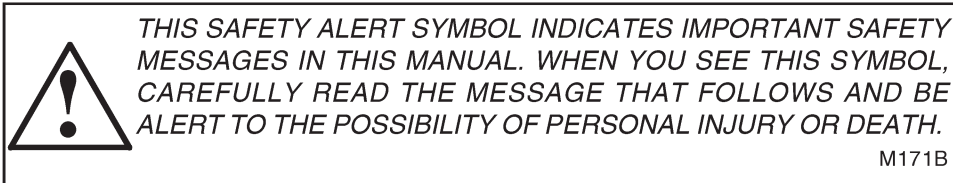
40 Crawler Series D

Service Manual

S-406294

Reprinted




CASE



If Safety Decals on this machine use the words **Danger, Warning or Caution**, which are defined as follows:

- **DANGER:** Indicates an immediate hazardous situation which if not avoided, will result in death or serious injury. The color associated with Danger is RED.
- **WARNING:** Indicates an potentially hazardous situation which if not avoided, will result in serious injury. The color associated with Warning is ORANGE.
- **CAUTION:** Indicates an potentially hazardous situation which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. The color associated with Caution is YELLOW.

If Safety Decals on this machine are ISO two panel Pictorial, decals are defined as follows:

- The first panel indicates the nature of the hazard.
- The second panel indicates the appropriate avoidance of the hazard.
- Background color is YELLOW.
- Prohibition symbols such as   and  if used, are RED.



WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH. BEFORE USING THIS MACHINE, MAKE CERTAIN THAT EVERY OPERATOR:

- Is instructed in safe and proper use of the machine.
- Reads and understands the Manual(s) pertaining to the machine.
- Reads and understands ALL Safety Decals on the machine.
- Clears the area of other persons.
- Learns and practices safe use of machine controls in a safe, clear area before operating this machine on a job site.

It is your responsibility to observe pertinent laws and regulations and follow Case Corporation instructions on machine operation and maintenance.

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SAFETY



THIS SAFETY ALERT SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL, WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS AND BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.



WARNING: Always use a non-flammable solvent for cleaning parts. **DO NOT** use gasoline or other flammable substances.



WARNING: Clean Rubber parts by washing in clean brake fluid. **DO NOT** use mineral base cleaning solvents such as acetone or paint thinner on any rubber parts. If a mineral base solvent is used, the rubber will start to deteriorate and continue to deteriorate after the part is put back into service. The continued deterioration of the rubber could cause the part to fail.



WARNING: **DO NOT** service the machine with the engine running. If necessary to make checks with engine operating, have one man stay at the controls while the other makes the check.



Whenever servicing the machine, always tag mark the ignition switch to alert other operators and prevent accidental start-ups.



WARNING: To help prevent eye injury, wear eye protection when servicing this machine.



CAUTION: When checking coolant level, remove cap on radiator slowly to relieve pressure within the system.



CAUTION: Disconnect both leads from the batteries when working on the engine or electrical system. Always disconnect the Ground lead first.



WARNING: Use extreme care when handling the track. Never insert fingers between track shoes when removing track.



DANGER: Exhaust fumes can kill. If necessary to start engine in an enclosed area, be sure to provide adequate ventilation.



CAUTION: **ENGINE FAN AND BELTS** - To prevent possible serious injury avoid contact with rotating fan and belts.



WARNING: **BATTERIES PRODUCE EXPLOSIVE GASES.** Keep flames, sparks and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.



POISON/DANGER: **BATTERY ACID CAUSES SEVERE BURNS.** Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing.

Antidote: **EXTERNAL** - flush with water. **INTERNAL** - drink large quantities of water or milk. Follow with Milk of Magnesia, beaten egg or vegetable oil. Call physician immediately. **EYES:** Flush with water for 15 minutes and get prompt medical attention.

KEEP OUT OF REACH OF CHILDREN.



WARNING: Do not allow battery fluid to contact skin, eyes, fabric or painted surfaces. Battery fluid is sulfuric acid solution which could cause serious injury or property damage.



CAUTION: When working on the hydraulic system, be sure to relieve all pressure in the lines by working the controls back and forth several times before removing component.



CAUTION: **NEVER** lay metal objects across the battery posts to check the charge. The air directly above the batteries contains highly explosive hydrogen gas. Sparks may cause an explosion.



DO NOT wear loose clothing which may catch in moving parts.

GENERAL

CAUTION: Hydraulic systems are high pressurized. Escaping hydraulic oil, even an invisible pinhole leak, can penetrate body tissues causing serious injury. Use a piece of wood or cardboard when looking for leaks - never use the hands or other parts of the body.



Relieve hydraulic pressure before disconnecting circuits. When reassembling, make absolutely certain that all connections are tight.

If injured by hydraulic oil escaping under pressure, see a doctor immediately. Serious complications may arise if medical attention is not given at once.

WARNING: This machine is equipped with a 24-volt starting system. Sparking will occur across greater distances than with a conventional 12 volt system. **NEVER WEAR RINGS OR OTHER METAL OBJECTS** that may ground a live circuit.



CAUTION: Warn all personnel who may be servicing or in path of machine before starting engine. Be sure all operating controls are in neutral and Parking Brake is set.



CAUTION: The idler wheel spring is under tension. If for any reason this spring must be removed, use **EXTREME** caution.



Inspect the machine daily for loose, worn or damaged parts. Have unsafe conditions corrected immediately.



CAUTION: Before removing or disassembling the swing brake, **SET BOOM ON GROUND** to prevent turntable from rotating.



WARNING: If boom is removed, do not swing the turntable over the side of the crawler base. The machine will tip. Never remove the boom unless the upperstructure is directly over the front or rear of the crawler base.



WARNING: To avoid personal injury, keep hands clear of turntable ring gear while turntable is being rotated.



Keep a fire extinguisher on hand and **KNOW HOW TO USE IT**. Check it regularly to ensure it is in good working order.



WARNING: Any changes to the controls must be clearly noted and posted in the Operator's Cab. If any control changes are made, a new Operator's Control Pattern decal must be installed in the cab to warn other operators of the changes.



Wipe oil spills, immediately and keep work area as clean as possible. A cluttered work area invites accidents.



WARNING: Never operate the alternator on an open circuit. With no battery or other electrical load on the circuit, a voltage buildup will occur within the alternator. This voltage buildup could be extremely dangerous to anyone touching the alternator "BAT" terminal.



CAUTION: When releasing grease from the track adjustment cylinder, loosen the adapter **SLOWLY**. Very high pressure can exist in the adjustment cylinder when under tension. The adapter fitting could fly loose and cause personal injury.



When bleeding brakes, loosen bleeder plug approximately one-half to three-quarter turn or until oil just starts to flow. If plug is loosened too far, it may be blown out under pressure.



CAUTION: Engage Digging Brake whenever the unit is not "crawling." Accidental engagement of the Drive Lock Switch will cause the machine to immediately move in the forward direction.



Never smoke while refueling, servicing the fuel system or working with batteries.

GENERAL INFORMATION

INTRODUCTION

This manual is designed to serve as a guide in maintaining and servicing the DROTT 40 Crawler, series "D". All components and systems are included, with the exception of the engine which is covered in the engine manufacturer's manual supplied with each machine.

The manual is divided into six sections, preceded by a general section on safety, machine description and specifications.

A separate section entitled "Scheduled Preventive Maintenance" is provided to cover all components which require periodic maintenance. Refer to this section whenever performing normal maintenance. It includes a Maintenance Schedule, Component Capacities, Hydraulic System Operating Pressures, Maintenance Chart and Maintenance Details.

The Service section is divided into three general areas - Mechanical, Electrical and Hydraulic. Included in the Service section is general descriptive and operational information to provide a basic understanding of each system and its components. All disassembly and repair information is contained in the last section of the manual and arranged in the general sequence established in the service section, i.e. Mechanical, Electrical and Hydraulic.

Troubleshooting charts for all the systems are contained in a separate section (See Section 5).

Torque Charts and Schematic Drawings of the Electrical and Hydraulic systems are located in back of this manual for easy reference when troubleshooting the machine.

If further service information is required, contact your nearest DROTT dealer or Service Representative for assistance.

EXPLANATION OF INTERNATIONAL SYMBOLS →

Symbols speak a universal language. International symbols are used in this manual to help identify components requiring service.

PARTS AND SERVICE

When writing to the dealer or manufacturer about you DROTT machine, always give reference to the model and PIN (Product Identification Number) in addition to the part name and location. The PIN plate is on the lower right corner of the cab (Figure 1).

All main components of the machine have an identification plate or number on the component housing. The location of the engine plate is shown in Figure 2.

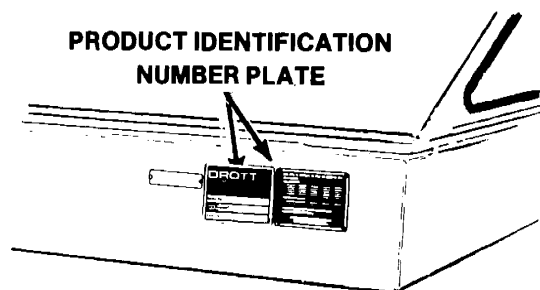


Figure 1. Machine Identification

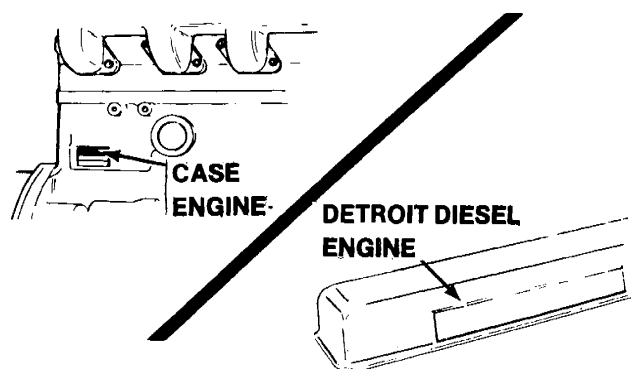








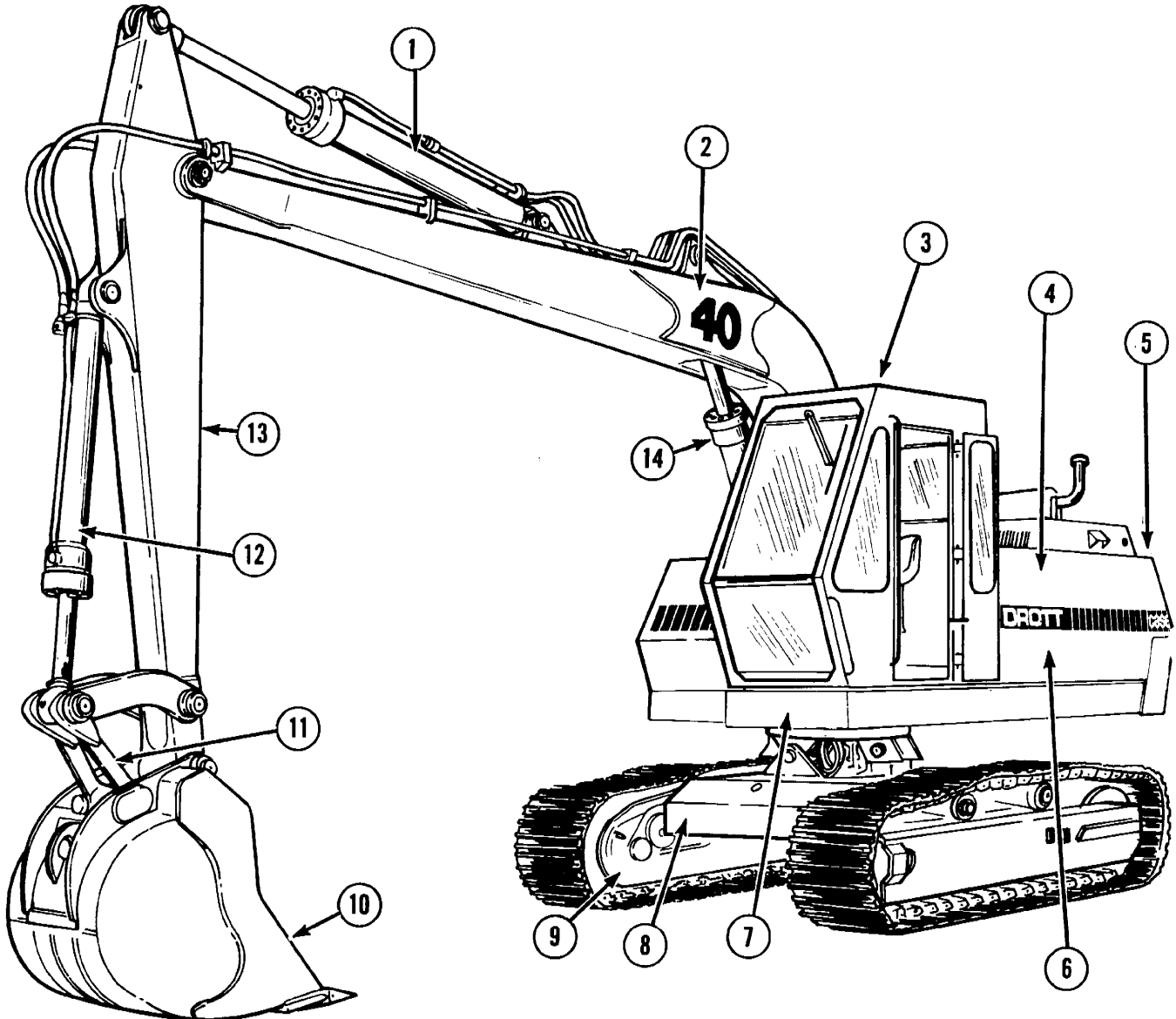


Figure 2. Engine Identification

 GEAR BOX	 HYDRAULIC RESERVOIR	 HYDRAULIC FILTER	 FILTER, AIR
 COOLANT	 ENGINE OIL	 DIESEL FUEL	 LUBRICATE with Multipurpose Grease

GENERAL

NOMENCLATURE



(Unit Shown in Digging Position)

- | | |
|---|---|
| 1. Boom Crowd Cylinder | 8. Track Drive Motor and Track Brake Location |
| 2. "E" Main Boom | 9. Final Drive Transmission |
| 3. Operator's Compartment with Controls | 10. Tool - (Backhoe Buckets Shown) |
| 4. Engine Location | 11. Tool Link and Levers |
| 5. Counterweights | 12. Boom Tool Cylinder |
| 6. Hydraulic Oil Reservoir Location | 13. "E" Boom Dipperstick |
| 7. Turntable Bearing, Ring Gear and Leveler | 14. Boom Hoist Cylinder |

Figure 3. Nomenclature

DIRECTIONAL REFERENCE

The turntable on this machine rotates through a full 360 degrees. The normal driving position is with the Boom over the front of the undercarriage (track drive transmission to the rear), as shown in figure 4. In this position, directional callouts for both the turntable and the undercarriage are the same. All references to Front, Rear, Right and Left will be made with respect to this position. RIGHT is the Operator's right; LEFT is the Operator's left.

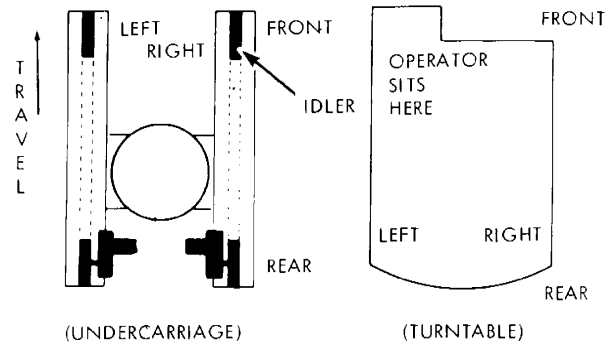


Figure 4. Directional Reference

GENERAL DESCRIPTION

The Drott 40 Crawler is a fully hydraulic excavator. Engine power is converted to hydraulic energy, then reconverted to mechanical force by means of cylinders and motors.

single spool valve (optional) to the machine's functions. To get maximum use of the engine's power, a "Power Sensing" valve is connected between the two main pumping circuits.

In the hydraulic system, oil from a 2-section gear pump is routed through two 4-spool valves and a

Figure 5 shows the distribution of the engine power to the hydraulic and electrical systems.

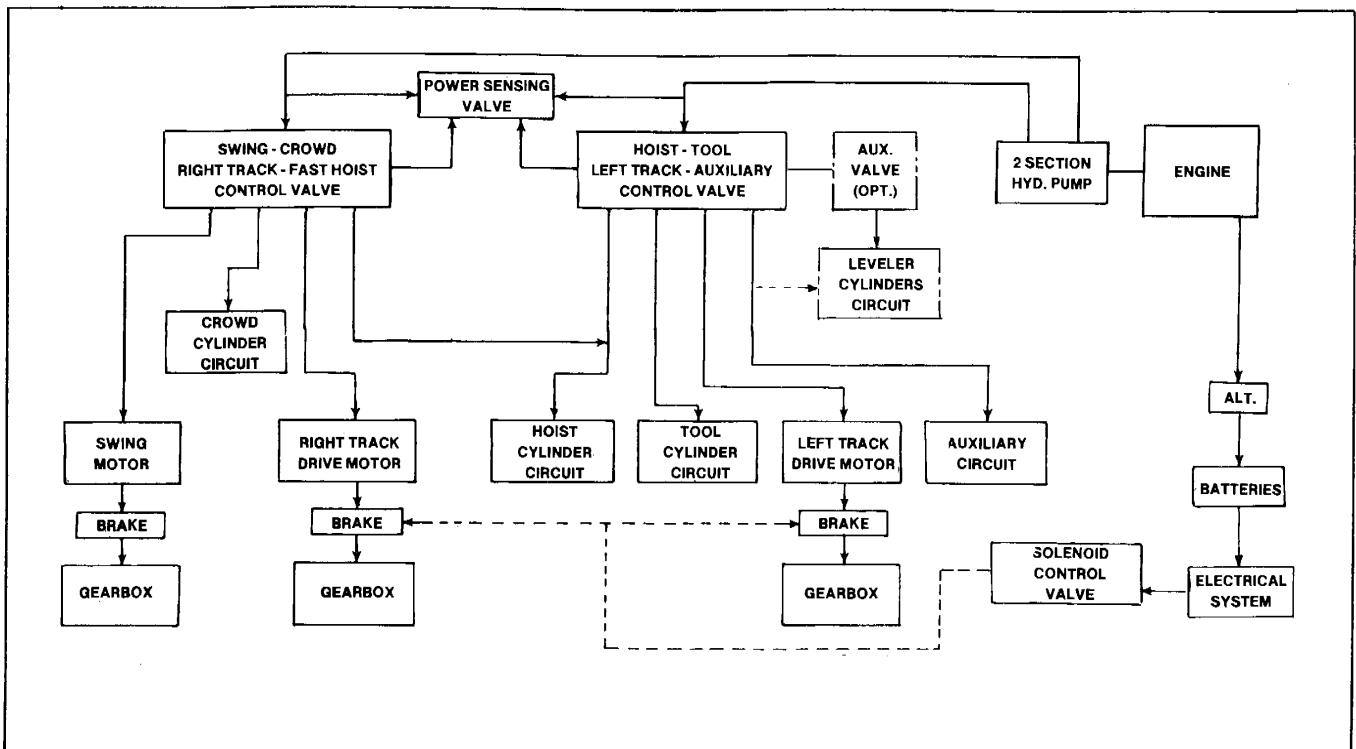


Figure 5. Block Diagram - 40 Crawler, Series "D"

GENERAL

SPECIFICATIONS

Engine:

MODEL	DETROIT DIESEL 4-71N	CASE 504BDT
No. of Cylinders	4	4
Bore and Stroke	4.25 in. x 5 in. (108 mm x 127 mm)	4.625 in. x 5 in. (118 mm x 127 mm)
Displacement	284 cu. in. (4 654 cm ³)	504 cu. in. (8 259 cm ³)
Horsepower @ Gov. RPM	157 (117 kw)	163 (122 kw)
SAE Net Horsepower	142.9 (107 kw)	148 (110 kw)
Maximum Torque	400 lb-ft (542 Nm) @ 1600 rpm	445 lb-ft (603 Nm) @ 1500 rpm
Compression Ratio	18.7:1	15.8:1
Governed RPM	2300	2100
High (No Load) RPM	2470	2280-2320
Low Idle	600	700-750

Undercarriage:

Track Frame..... Rigid, welded construction
 Track Idlers..... Sealed hub, spring cushion, hydraulic adjust
 Crawler Drive..... two-speed optional, hydraulic gear motor, spur gear final drive
 Track Brake..... hydraulically released disc, on input to final drive
 Track Rollers..... cast and machined construction, sealed hub, 8 per side
 Carrier Rollers..... cast and machined construction, sealed, 2 per side

Turntable Swing: Single race ball bearing with integral ring gear; powered by hydraulic gear motor through DROTT gearbox. Mechanically actuated disc brake on input to gearbox (for holding brake only).

Electrical System:

Machines through PIN 6270854:

Type..... 12 volt, with 24 volt start, direct current, negative ground
 Batteries..... Two 12 volt "maintenance-free", connected in series,
 625 amps @ 0° F for 30 seconds
 Alternator..... 72 amp
 Charge Control Unit..... Duvac® , solid state, automatic

Machines with PIN 6270855 and After:

Type..... 24-volt, direct current, negative ground
 Batteries..... Two 12 volt, 625 amp batteries connected in series
 Alternator..... 42 amp
 Lights..... 24 volt

Hydraulic System:

Type..... Two pumping circuits, summated
 Pump (Main)..... Two section gear, driven off rear of engine
 Main Control Valves..... Two 4-spool valves, single spool auxiliary valve optional; Series and parallel
 spools for simultaneous operation of two or more functions
 Filters..... Two 100 mesh screens and two 10 micron full flow filters in return lines; four 140 mesh
 screens in summator system; two screen diffusers and filler screen in tank
 Cylinders..... Double-acting type for hoist, crowd, tool and auxiliary functions, single-acting type
 for optional leveler
 Motors..... Gear type for swing and track drive functions

**SECTION 1
SCHEDULED PREVENTIVE MAINTENANCE**

INTRODUCTION

Scheduled preventive maintenance is necessary to keep the machine in top operating condition. Decide from the start upon a maintenance schedule that will best suit your particular needs. The type of work being done, the size of loads, and ground and weather conditions should all be taken into consideration when establishing a schedule.

Use the engine hourmeter along with a calendar and checklist to ensure that all recommended maintenance is performed at the prescribed intervals. Recommendations contained in this manual are based upon average operating conditions, and should be considered as MINIMUM maintenance requirements for the CRAWLER.

Depart from recommended intervals only when conditions warrant shortening them, or when changes in ambient temperature require it. Recommended intervals should be shortened whenever the machine is operated under extreme conditions, such as on a dusty job site, in extreme heat or cold, under intermittent operation or extremely heavy loads.

LUBRICANTS

It is not Drott policy to publish lists of approved lubricants or to guarantee lubricant performance. The responsibility for the quality of any lubricant rests solely with the distributor or manufacturer of the lubricant.

In various paragraphs of this manual, you will find the statement "Use (lubricant brand name) or functional equivalent". This statement does not constitute an unconditional guarantee of the performance of the brand of oil mentioned; it is intended only as a guide to the type of lubricant recommended for a given application.

SOUNDPROOFING INSULATION

Care must be taken when cleaning the cab interiors that have soundproofing insulation. To clean the insulating material, use only a vacuum cleaner or damp cloth with plain water or mild detergent solution.

DO NOT steam clean, wash or rinse with a water hose, etc., since only slight wetting of the insulation will substantially reduce its soundproofing capabilities.

SPARK ARRESTOR

Laws of some states or provinces may require that this unit be equipped with a spark arrestor or spark arresting muffler. The State of California, as an example, is one state which has such regulations for agricultural and forestry applications, plus a regulation for construction applications in forest-covered, brush-covered or grass-covered lands.

Typically, such laws and regulations require spark arresting devices to be maintained in good working order and typically to be attached to the exhaust system on naturally aspirated engines (engines without a turbo-charger).

IMPORTANT: Always install new decals whenever the old decals are destroyed, lost, painted over, or illegible. When individual parts are replaced that have decals attached, be sure to install a new decal with the new part. Replacement decals are available from your Drott dealer.

PREVENTIVE MAINTENANCE

HYDRAULIC OIL RECOMMENDATIONS

Drott DHF Fluid is recommended for year-around use in the hydraulic system; or as alternate, use oils listed below:

OIL WEIGHT	SYSTEM OPERATING TEMPERATURE
SAE 20-20W	50° to 210° F (10° to 99° C)
SAE 10W	0° to 180° F (-18° to 82° C)
SAE 5W or 5W-20	Arctic Conditions

Viscosity: The viscosity of the oil at starting should not exceed 4000 SSU or drop below 60 SSU for sustained high temperature operation. The optimum

operating conditions are between 80 SSU and 180 SSU. The viscosity index should not be less than 90 (for this service).

Arctic Conditions: The use of an auxiliary heater, a warm-up period avoiding high speed operation of hydraulic components until the system is warm, and the use of SAE 5W or SAE 5W-20 oils may be necessary, provided the viscosity requirements for sustained high temperature operation are not exceeded at maximum operation temperatures. See preceding paragraph on Viscosity.

HYDRAULIC SYSTEM OPERATING PRESSURES			
VALVE/CIRCUIT	LOCATION	PRESSURE SETTING	
		psi	kPa
Main Reliefs	Inlet to Main Control Valves	3000	20 680
Port Reliefs - Hoist, Tool, Crowd and Auxiliary	Cylinder Ports of Main Control Valves	3200	22 060
Track Port Reliefs	Main Control Valves	2500	17 200
Swing Port Reliefs	Main Control Valves	2500	17 200
Swing Cushion (Crossover Reliefs)	In-Line	1550	10 700
Power Sensing Reliefs	In Power Sensing Valve	2500	17 200

PREVENTIVE MAINTENANCE

COMPONENT CAPACITIES

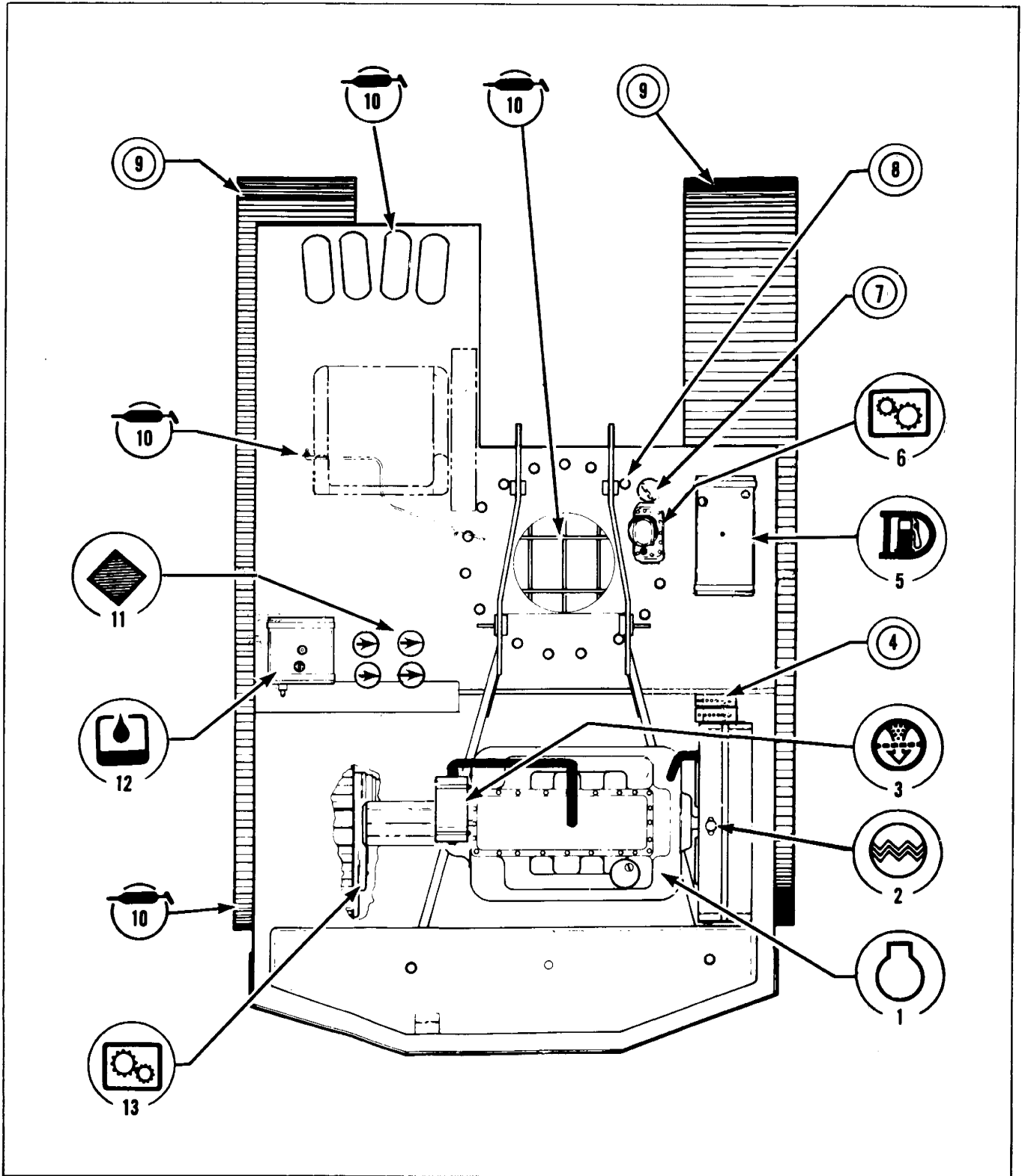
Component	Lubricant/Fluid	Capacity
Engine Cooling System	½ ethylene glycol base anti-freeze, ½ water	8½ gallons (32 litres)
Engine Crankcase	See Engine Manufacturer's Manual	See Specifications, page 8
Fuel Tank	No. 2 Diesel Fuel, See Engine Manual	75 gallons (284 litres)
Hydraulic System (Complete)	DROTT DHF Fluid or See Page 10	55 gallons (208 litres)
Hydraulic Oil Tank		25 gallons (95 litres)
Final Drive Transmissions	HD80-90 Gearlube	14 quarts (13.2 litres)
Swing Gearbox	HD80-90 Gearlube	11 pints (5.2 litres)
Turntable Bearing Ring Gear	Open Gear Lubricant, such as Mobil Mobitac E, Texaco Crater Compound, or functional equivalent	Apply liberal amount. Rotate turntable so pinion spreads the lubricant
Pressure Grease Fittings	Multipurpose E.P. No. 2 lithium grease, molydisulfide grease, or functional equivalent	Use sufficient amount to remove the old, contaminated grease at each location (See List of Grease Fittings)

RATED PUMP OUTPUT @ GOV. RPM

ENGINE	OUTPUT PER SECTION	
	GPM	L/MIN
Detroit Diesel 4-71N	46	174
Case 504BDT	51	193

PREVENTIVE MAINTENANCE

MAINTENANCE CHART



PREVENTIVE MAINTENANCE

Daily - 10 Hours
 Weekly - 50 Hours
 2 Weeks - 100 Hours
 Monthly - 250 Hours
 2 Months - 500 Hours
 6 Months - 1500 Hours
 12 Months - 3000 Hours

PREVENTIVE MAINTENANCE CHART

REF.	COMPONENT/SYSTEM	Daily - 10 Hours	Weekly - 50 Hours	2 Weeks - 100 Hours	Monthly - 250 Hours	2 Months - 500 Hours	6 Months - 1500 Hours	12 Months - 3000 Hours	SERVICE/CHECK	INSTRUCTION
1	ENGINE	X							Check oil, drain fuel filter	See Engine Manual
			X						Change oil and filters	See Engine Manual
2	RADIATOR, COOLING SYSTEM	X							Check coolant level	See page 16
			X						Clean fins, remove obstruction, check fan belts	See page 32
					X				Check specific gravity, add corrosion inhibitor	See page 31
							X		Drain and flush system	See Engine Manual
3	AIR CLEANER	X							Check restriction indicator, empty dust cup	See page 17
					X				Clean or replace element	See page 17
4	BATTERIES		X						Check electrolyte level (except "Maintenance Free" type)	See page 17
						X			Clean battery case, posts and connections	See page 17
5	FUEL TANK	X							Fill at end of shift, drain water from tank	See page 17
					X				Clean breather	See page 17
6	SWING GEARBOX		X						Check oil level	See page 18
						X			Change oil, clean breather	See page 18
7	TURNTABLE BEARING	X							Lubricate the ring gear	See page 18
			X						Lubricate the bearing race (thru Central Lube)	See Illustrated Listing
8	TURNTABLE CAPSCREWS			X				Check torque (See also "Special Maintenance" below)	See page 36	
9	TRACK	X							Grease pillow blocks, clean tracks	See Illustrated Listing
			X						Check and adjust track tension	See page 25
10	LUBRICATION FITTINGS	X	X					Apply grease per intervals in Illustrated Listing	See page 14	
11	HYDRAULIC FILTERS				X				Clean 100 mesh screens, replace paper elements	See page 19
		X							Check oil level	See page 19
12	HYDRAULIC OIL TANK				X				Replace breather	See page 19
						X			Change oil, clean screens	See page 19
							X		Change oil, look for damage or leaks	See page 20
13	FINAL DRIVE TRANS.		X						Change oil	See page 20
						X			Change oil	See page 20
14	CAB and CONTROLS	X							Clean cab, check operation of controls	See page 9
				X					Check condition and adjustment of the controls	See page 91
15	BOOM and ATTACHMENT	X						Lubricate thoroughly	See page 39	

SPECIAL MAINTENANCE

End of First Day or First 10 Hours of Operation

Hydraulic Filters Replace paper elements, clean 100 mesh screens
 Hose clamps Tighten all hose clamps on radiator hoses and hydraulic hoses.

After First 20 Hours of Operation

Case engine Change run-in oil and filters. See Engine Manual

After First Week or 50 Hours of Operation

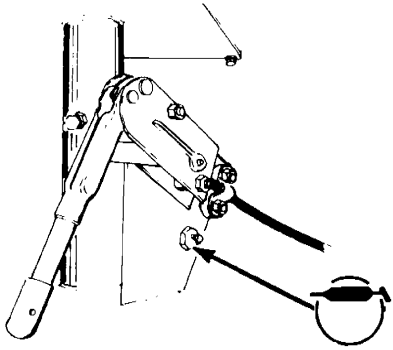
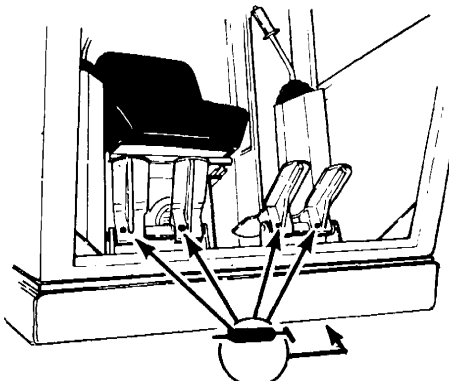
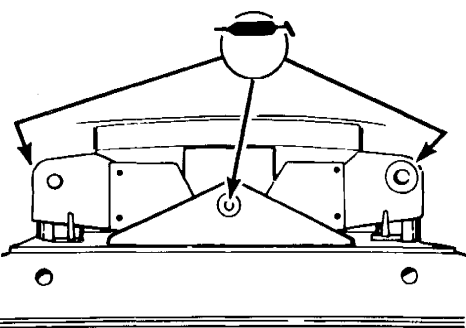
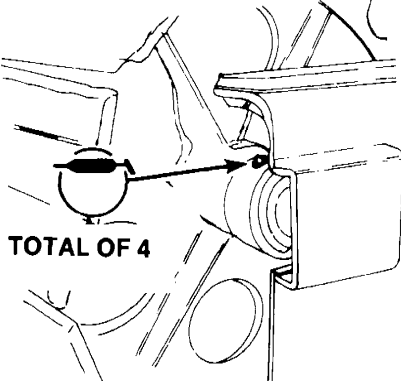
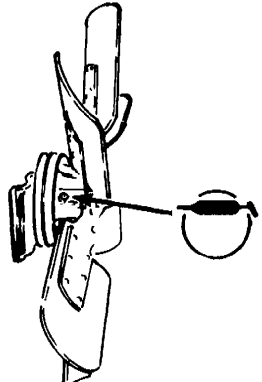
Turntable Capscrews Check for correct torque

PREVENTIVE MAINTENANCE

ILLUSTRATED LISTING OF GREASE FITTINGS

LUBRICATION FITTING CHART			
Figure No.	Location/Title	Qty.	Interval
6	Turntable Bearing	1	Weekly/50 hours
7	Controls and Linkages	12	Weekly/50 hours
8	Turntable Leveler	4	Weekly/50 hours
9	Drive Sprocket Pillow Block	2 per side	Daily/10 hours
10	Fan Pulley (Detroit Diesel Engine)	1	Weekly/50 hours
11	"E" Boom Pins	15	Daily/10 hours*
12	"Y" Boom and Pins	18	Daily/10 hours*

*Grease at least every 4 hours for first 20 hours of operation.
Continue to grease every 4 hours if working conditions are severe.

 <p>Figure 6. Lubrication Point for Turntable Bearing</p>	 <p>TOTAL OF 12</p> <p>Figure 7. Controls and Linkages</p>	
<p>TOTAL OF 4</p>  <p>Figure 8. Turntable Leveler</p>	 <p>TOTAL OF 4</p> <p>Figure 9. Drive Sprocket Pillow Block</p>	 <p>Figure 10. Fan Pulley (Detroit Diesel Engine)</p>

ILLUSTRATED LISTING OF GREASE FITTINGS

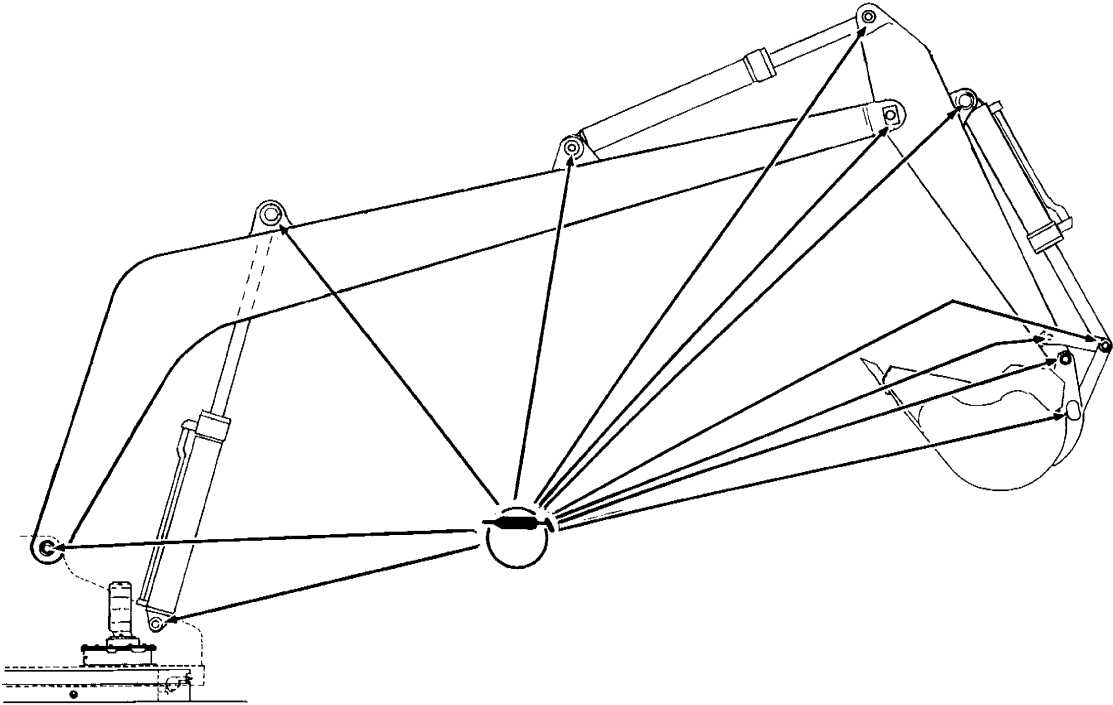


Figure 11. Lubrication Points on "E" Boom

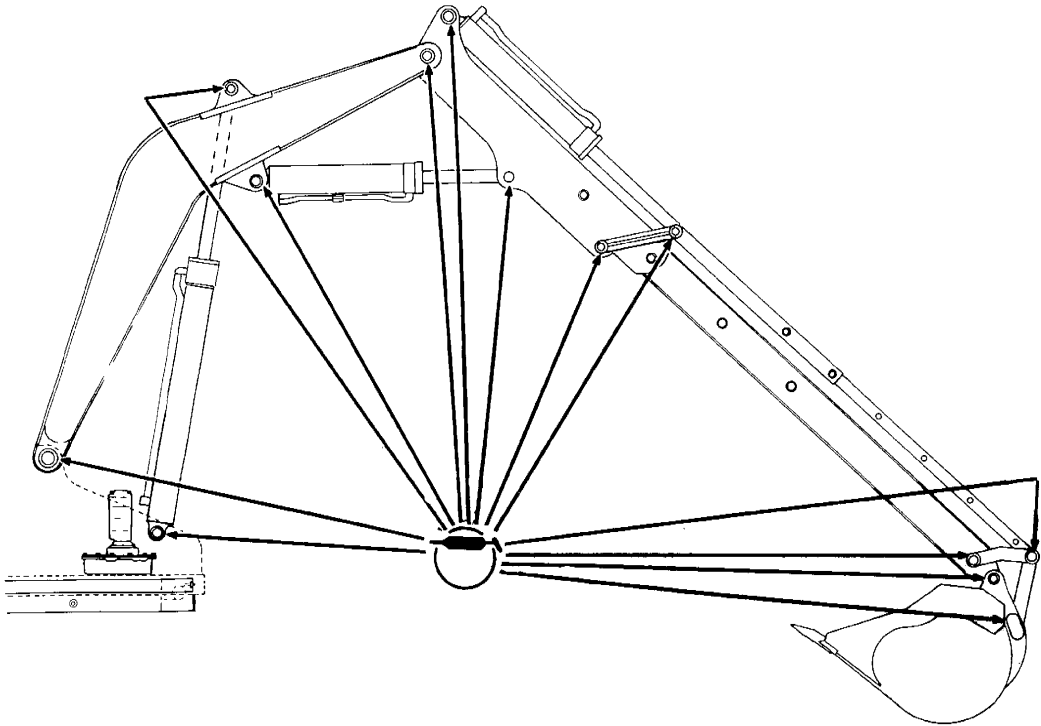


Figure 12. Lubrication Points on "Y" Boom

PREVENTIVE MAINTENANCE

ITEMIZED INSTRUCTIONS

1. **ENGINE**-Refer to Engine Manufacturer's Manual. Open the petcock on the Fuel Filter Bowl at the beginning of each shift and drain approximately ¼ pint (.1 liter). This will help prevent condensation and sediment build-up in the fuel system.

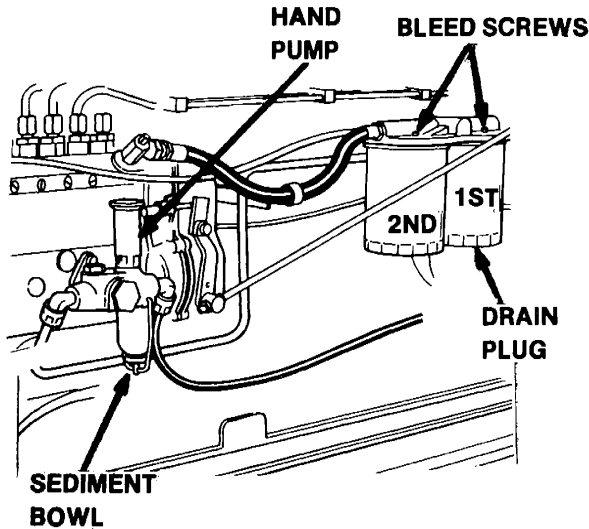


Figure 13. Fuel Filters on Case Engine

DRAIN PETCOCK

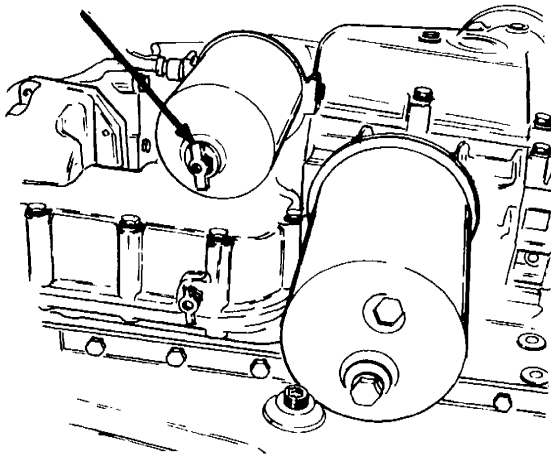


Figure 14. Fuel Filter on Detroit Diesel Engine

2. **RADIATOR AND OIL COOLER** - Check Radiator coolant level daily. When freezing temperatures threaten, fill with solution of 50% ethylene glycol base antifreeze and 50% water.

NOTE: Antifreeze with sealant additives is **NOT** recommended in Detroit Diesel Engines due to the possibility of plugging cooling system ports.



CAUTION: When checking coolant level, remove cap on radiator slowly to relieve pressure within the system.

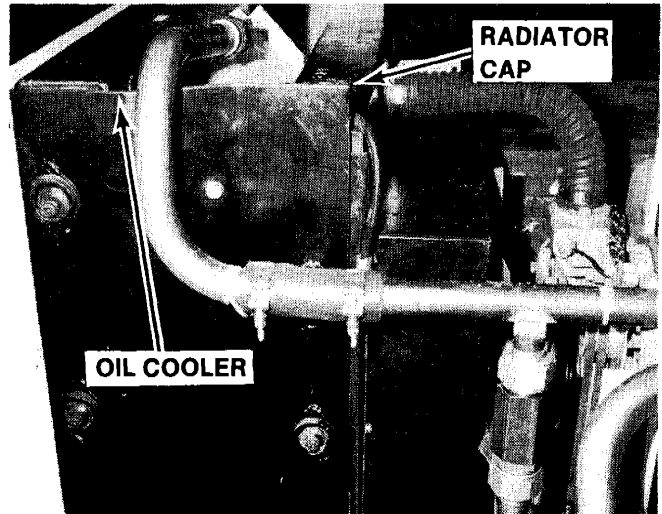


Figure 15. Radiator and Oil Cooler

Blow foreign matter from Radiator and Oil Cooler fins weekly. Inspect hoses and connections for leaks and cracks at the same time. Be sure the engine is shut off when using compressed air. If overheating occurs in hot weather, the following suggestions are offered to help ensure maximum cooling system efficiency:



CAUTION: ENGINE FAN AND BELTS - To prevent possible serious injury avoid contact with rotating fan and belts.

- a. Keep radiator and oil cooler fins clean.
- b. Check the radiator pressure cap. It must maintain 7 psi (48 kPa) on the Radiator. Either high or low pressure can cause overheating.

PREVENTIVE MAINTENANCE

- AIR CLEANER** - Check Air Restriction Indicator on air cleaner inlet line daily. Remove and clean (or replace) the element when the red indicator band remains in full view with the engine off. Remove the dust cup daily or every 10 hours and clean out accumulated dust.

Clean and inspect (or replace) the element every 500 hours or two months whichever occurs first. To service the element, remove and tap it against your hand. Blow out from inside with compressed air. Then wash in a solution of non-sudsing detergent (DO NOT use HOT water). Shake out excess water and let dry.

NOTE: Never run an engine with the Air Cleaner or Dust Collector removed.

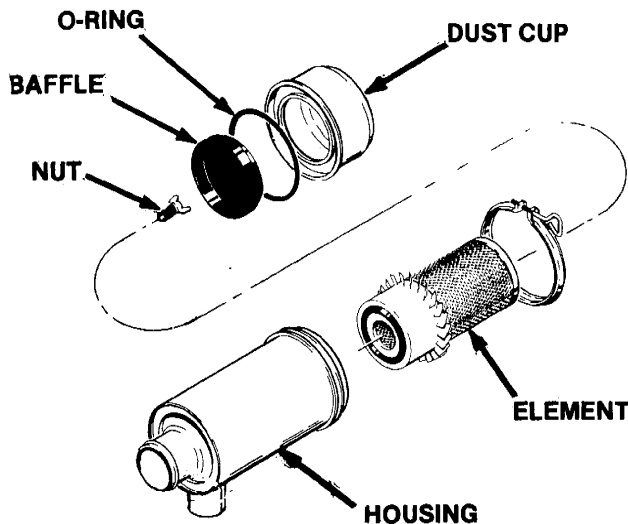


Figure 16. Engine Air Cleaner

Test element by holding a lighted bulb inside. If light shows through unevenly, replace the element. Keep an extra element on hand for quick replacement.

NOTE: Air Cleaner elements should be replaced after five cleanings.



CAUTION: Disconnect both leads from the batteries when working on the engine or electrical system. Always disconnect the Ground lead first.

- BATTERIES** -Clean Battery terminals and other metal parts with soda water solution and rinse with clean water every 1500 hours or six months. Brighten terminal posts and inside of connectors with a wire brush. After connecting terminals, coat them with petroleum jelly or STP oil treatment to help prevent corrosion. On units not equipped with "Maintenance-free" batteries, check the electrolyte level weekly or every 50 hours. Add distilled water as necessary to keep the electrolyte level above the cell plates.



WARNING: BATTERIES PRODUCE EXPLOSIVE GASES. Keep flames, sparks and cigarettes away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.

- FUEL TANK** - Keep the Fuel Tank filled to prevent condensation when the machine is not being used. Refer to Engine Manufacturer's Manuals for fuel recommendations. Drain water trap in bottom of tank daily or every 10 hours.

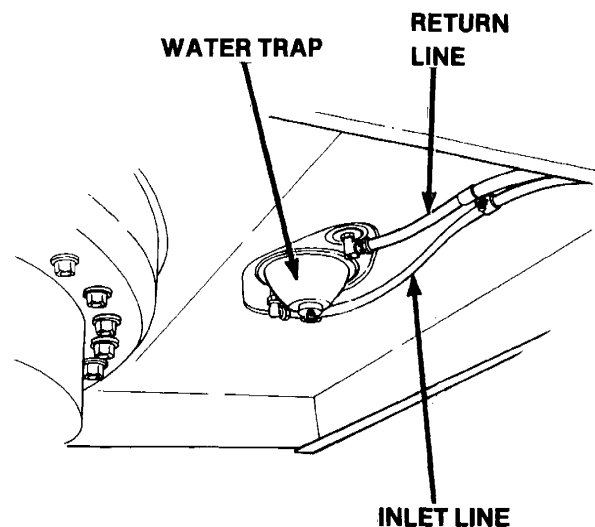


Figure 17. Fuel Tank Water Trap



Never smoke while refueling, servicing the fuel system or working with batteries.

PREVENTIVE MAINTENANCE

6. **SWING GEARBOX** - Check oil level weekly or every 50 hours whichever comes first. Drain and refill every 6 months or 1500 hours, whichever comes first. FILL, CHECK and DRAIN plugs are shown in Figure 18.

Check and adjust house brake monthly, every 250 hours, or as necessary. See page 36.

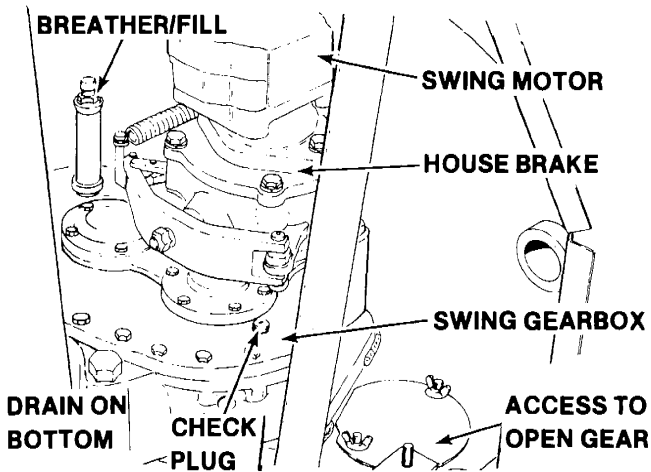


Figure 18. Turntable Ring Gear Access Hole and Swing Mechanism

7. **TURNTABLE BEARING RING GEAR** - Lubricate daily or every 10 hours, whichever occurs first. Use a spray-on open gear lubricant such as Mobilac E, Sohio Sohitarac No. 1, Sunoco 407 Compound B, Texaco Crater Compound or functional equivalent.

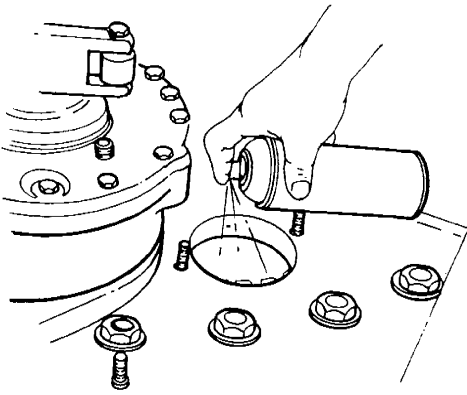


Figure 19. Lubricating the Ring Gear

Remove the access cover and spray or brush on the lubricant while the Turntable is slowly rotating through 360°. (See figure 19.)

NOTE: Rotate turntable so that Pinion helps spread the lubricant.



WARNING: To avoid personal injury, keep hands clear of turntable ring gear while turntable is being rotated.

8. **TURNTABLE CAPSCREWS** - The capscrews which hold the turntable to bearing and bearing to carbody should be checked for proper torque after the first 50 hours or first week of operation. Thereafter they should be checked every 250 hours or monthly, whichever comes first.

9. **TRACK** - Track Rollers are pre-lubricated and sealed. They require no periodic lubrication. Check the Rollers for leaks. Grease the Drive Sprocket Pillow Block Bearings daily or every 10 hours with a general purpose lithium base grease. See Illustrated Listing.

Check the Track for proper tension every 50 hours or weekly, whichever comes first. See page 25.

10. **LUBRICATION (GREASE) FITTINGS** - Lubricate all grease fittings at the intervals indicated in the LUBRICATION FITTING CHART. Lubrication points in high wear areas such as the boom and bucket must be greased at least every 4 hours for the first 20 hours of operation and daily or every 10 hours thereafter. If working conditions are severe, continue to grease these areas after every 4 hours. Use a multipurpose lithium base grease, unless otherwise noted. When working in wet or swampy areas, grease those components exposed to water every 4 hours. If grease fitting will not accept lubricant, remove it and clean out the obstruction or replace the fitting. Apply sufficient grease to force out the old grease.

PREVENTIVE MAINTENANCE

11. **IN-LINE HYDRAULIC FILTERS** - Every 2 months or 500 hours clean the screen filters and replace the paper filters. The filters are found at the rear of the boom. See Figure 20. Clean around the filter housings before servicing to prevent entry of dirt into the hydraulic system.

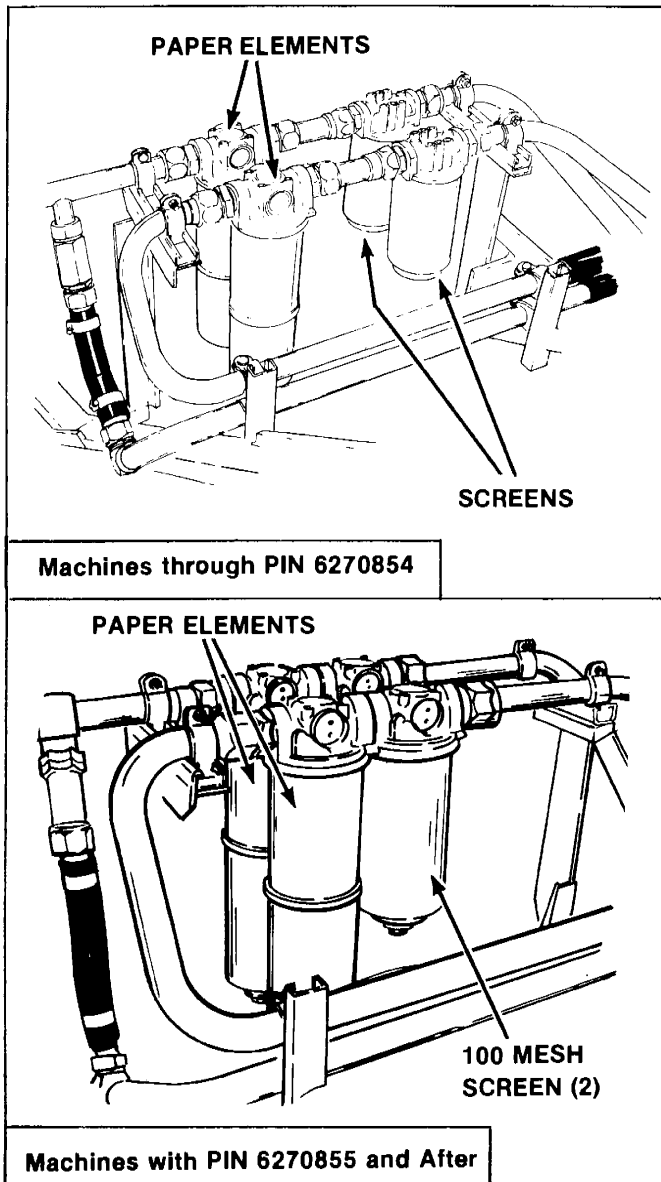


Figure 20. Location of In-Line Hydraulic Filters

To service the 100 Mesh Screens: (Machines through PIN 6270854)

- a. Unscrew the center post. Remove center post, housing, back-up washer and filter element.

- b. Discard old seals. Clean filter element and parts in non-flammable solvent. Blow dry with compressed air. If screen has damage, replace the screen.
- c. Install new seals and assemble the filter as shown in figure 21.
- d. Tighten the center post to a torque of 40 lb-ft (54 Nm) maximum.

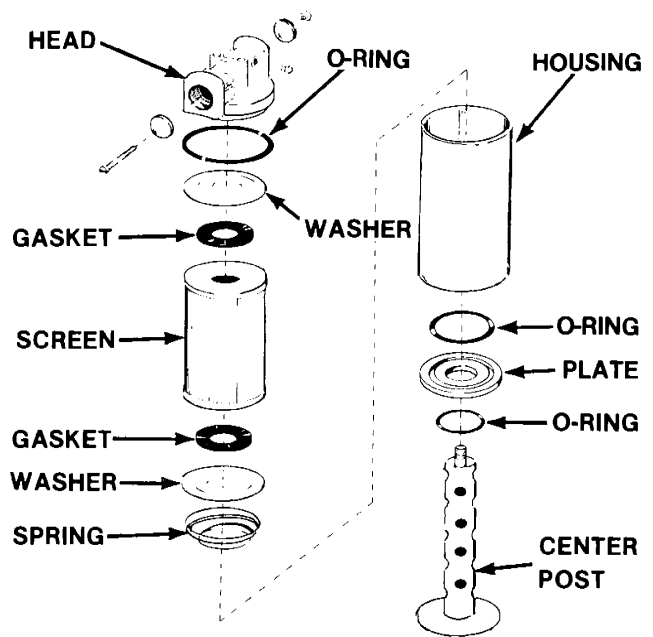


Figure 21. Screen Filter - Machines through PIN 6270854

NOTE: On machines with PIN 6270855 and after, a tandem filter assembly is installed. Refer to figure 22 for basic arrangement of the internal parts.

To service the Paper elements and Tandem Filter:

- a. Loosen the center bolt and remove it along with the filter housing, element and indicator assembly.
- b. Remove filter element from housing. Remove the indicator from the element with a twisting motion. **DO NOT** attempt to pull it straight out or pry it loose. The indicator ears are fragile.