SERVICE MANUAL

Section 2 PREVENTIVE MAINTENANCE

INDEX

2-1. GENERAL

This section contains instructions necessary for proper preventive maintenance. Preventive Maintenance is divided into three subsections: Lubricant Specifications, Preventive Maintenance Schedule and Checklist, and Preventive Maintenance Procedures. The Lubricant Specifications reflect the standard requirements to which the oils and greases used must comply. A lubricant chart is implemented listing components, capacities, types of lubricant and specific temperatures at which lubricants can be safely used. The Preventive Maintenance Schedule and Checklist provides a listing of all maintenance checks which must be performed and may be copied for use as a check-off sheet for a machine maintenance record. The Preventive Maintenance Procedures provides detailed instructions for performing the maintenance checks.

2-2. LUBRICANT SPECIFICATIONS

A. FUEL (F)

Use only distillate fuels meeting Deutz and type T-T requirements for your region. Further information may be obtained by contacting the United States Energy Research and Development Administration, Bartlesville Energy Research Center, Bartlesville, Oklahoma, 74003.

B. ENGINE OIL (EO)

Use Heavy Duty Engine Oils which meet the requirements of MIL-L-2104C Oils. API (American Petroleum Institute) Engine Service Classification, CD, identifies an oil which satisfies MIL-L-2104C requirements. Refer to the Lubricant-Capacity-Temperature Chart for the Correct SAE Viscosity Grade.

C. HYDRAULIC OIL (HO)

Transmission Fluid type F is acceptable for use in the hydraulic system (hydrostatic transmission, steering and bucket actions), since it is considered to be satisfactory over a wide temperature range and easily obtainable worldwide.

CAUTION

DO NOT USE TRANSMISSION FLUID TYPE C-2, A OR DEXRON` IN THE HYDRAULIC SYSTEM.

D. HYDRAULIC BRAKE FLUID (HBF)

Use heavy duty brake fluid (non-mineral) in the service brake system, which conforms to the SAE J-1703e and DOT 3 specifications.

E. GEAR OIL (GO)

Use gear lubricant oil meeting the requirements of MIL-L-2105B for SAE 90 and 140 gear lubricant in the transfer case in the differentials and wheel ends. SAE 90 must have a viscosity of 75 - 120 SUS at 210°F (98.8°C). SAE 140 must have a viscosity of 120 - 160 SUS at 210°F (98.8°C).

F. MULTI-PURPOSE GREASE (MPG)

Use multi-purpose grease which contains both 1 to 5% molybdenum disulfide confroming to MIL-L-7866, and a suitable corrosion inhibitor. NLGI grade No. 2 is suitable for most temperatures. NLGI No. 1 or No. 0 are suitable for extremely low temperatiures.

G. LUBRICANT - CAPACITY - TEMPERATURE CHART

COMPONENT	LUBRICANT	CAPACITY (Approximate)	TEMPERATURE		
			Below 32°F (Below 0°C)	32 - 90°F (0 - 32°C)	Above 90°F (Above 32°C)
ENGINE	EO	3.5 Gallons (13.2 liters)	SAE 20W/20	SAE 30	SAE 30
FUEL	F	10 Gallons (37.8 liters)	ERDA Type T-T, No. 2-D Diesel fuel, ASTM-975		
PUMP DRIVE	EO	0.5 Gallons (2 liters)	SAE 20W/20	SAE 30	SAE 30
TRANSFER CASE	GO	0.5 Gallons (2 liters)	SAE 90	SAE 90	SAE 140
DIFFER-ENTIALS	GO	1.7 Gallons (6.6 liters) Each	SAE 90	SAE 90	SAE 140
WHEEL ENDS	GO	2.5 Pints (1.2 liters) Each	SAE 90	SAE 90	SAE 140
HYDRAULIC SYSTEM	HO	10 Gallons (37.8 liters)	Type F or Mobol 300 or equivalent.		
BRAKE RESERVOIRS	HBF	1 Pint (0.5 liters) Each	Must meet SAE J1703e and DOT 3 specifications.		
ALL LUBE POINTS	MPG	As Required	NLGI No. 1 or No. 0	NLGI No. 2	NLGI No. 2

CAUTION DO NOT USE CHART ALONE. REFER ALSO TO THE SPECIFICATIONS FOR EACH LUBRICANT.

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

NOTE

THE FOLLOWING PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST MAY BE REMOVED AND DUPLICATED FOR USE AS A CHECK-OFF SHEET FOR A MACHINE MAINTENANCE RECORD.

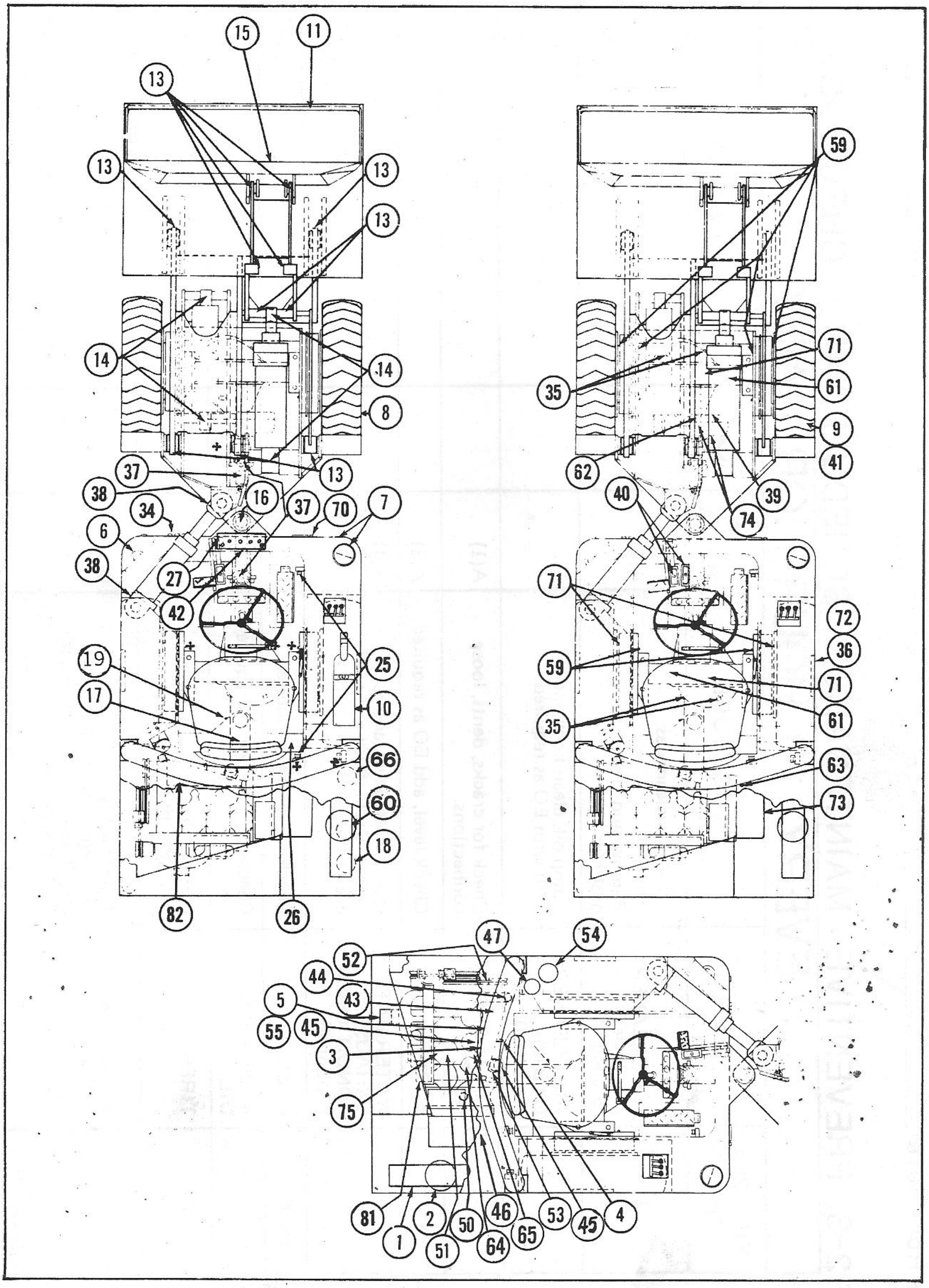


FIGURE 2-1. PREVENTIVE MAINTENANCE CHECKPOINT LOCATIONS (Refer to the Preventive Maintenance Schedule and Checklist)

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 10 HOURS OR DAILY

FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
1	AIR CLEANER Dry Type (Standard)	Empty precleaner as required. Remove and clean dust cup.	A(1)		
2	AIR CLEANER Oil Bath (Optional)	Dump oil, clean bowl and refill with EO as required.			
3	AIR TRANSFER DUCT	Check for cracks, dents, loose connections.	A(1)		
4	ENGINE OIL	Check level, add EO as required.	A(3)		
5	WATER BATH EXHAUST CONDITIONER (Optional)	Check water level, add as required. Drain, flush and refill every other shift.	A(4)		
6	FUEL	Check level, add as required.	A(2)		
7	HYDRAULIC OIL	Check level, add HO as required.	D(1)		
8	TIRES	8.25x15, 14-ply: inflate tire to 80 PSI (5.5 bars).	C(3)		
9	WHEEL LUG NUTS	Tighten daily to 150 ft. lb. (20.7 kg-m) for first 50 hours after loosening nuts, every 250 hours thereafter.	C(3)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 10 HOURS OR DAILY (CONT'D)

FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
10	FIRE EXTINGUISHER	Check pressure gauge.	G(1)		
11	BUCKET CUTTING LIP	Check lip condition.	F(1)		
12 (not shown)	GENERAL INSPECTION	Walk around machine, look for leaks, damage, loose parts, etc.			
13	LIFT ARM AND BUCKET PIVOT PIN BEARINGS	Lube 11 fittings with MPG.			
14	HOIST AND BUCKET PIVOT PIN BEARINGS	Lube 4 fittings with MPG.			
15	PUSH-PLATE CYLINDER PIVOT PIN BEARINGS (if equipped)	Lube 2 fittings with MPG.			
16	CENTER PIVOT PIN BEARINGS	Lube 2 fittings with MPG.			
17	REAR AXLE BOLSTER	Lube 1 fitting with MPG. Time interval for lube can be at the discretion of the maintenance personnel.	C(5)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 10 HOURS OR DAILY (CONT'D)

FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
18	TRANSMISSION HIGH PRESSURE LINE FILTER.	Check indicator daily, service as required.	B(5)		
19	SEAT ADJUSTMENT	Add air as required.			

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 50 HOURS OR WEEKLY					
FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✔	COMMENTS
24 (not shown)	ALL 10 HOUR CHECKS				
25	TRANSMISSION CONTROL LINKAGE	Lube 2 fittings with MPG.			
26	THROTTLE CONTROL LINKAGE	Lube 1 fitting with MPG.			
27	BRAKE PEDAL PIVOT	Lube 1 fitting with MPG.			
28 (not shown)	OVERALL MACHINE	Wash down the entire machine.	G(2)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 125 HOURS OR TWO WEEKS

FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
33 (not shown)	ALL 50 HOUR CHECKS				
34	FUEL TANK	Remove plug and drain condensate.	A(2)		
35	FRONT AND REAR DIFFERENTIALS	Check oil level, add GO as required.	C(2)		
36	WHEEL ENDS	Check oil level, add GO as required.	C(4)		
37	DRIVELINES	Lube 3 fittings with MPG.			
38	STEERING CYLINDER	Lube 2 fittings with MPG.			
39	TRANSFER CASE	Check the oil level, add GO as required.	B(2)		
40	BRAKE MASTER CYLINDERS	Check fluid level, add HBF as required.	D(1)		
41	WHEEL LUG NUTS	Tighten to 150 ft. lbs. (20.7 kg-m).	C(3)		
42	BATTERY	Check electrolyte level, service as necessary.	E(1)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 125 HOURS OR TWO WEEKS (CONT'D)

FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
43	INJECTION PUMP	Check oil level. Add EO as required. (If applicable).	A(8)		
44	FUEL LIFT PUMP	Clean strainer.	A(9)		
45	ENGINE COOLING FINS AND OIL COOLERS,	Clean cooling fins.	A(7), A(12)		
46	PUMP DRIVE HOUSING	Check oil level, add EO as required.	B(1)		
47	ENGINE CRANKCASE	Drain and refill.	A(3)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 250 HOURS OR MONTHLY					
FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
49 (not shown)	ALL 125 HOUR CHECKS				
50	FLYWHEEL HOUSING	Check the flywheel housing for oil leakage from the pump drive housing seal.	B(3)		
51	ENGINE VALVES	Check the valve clearance.	A(5)		
52	DRIVE BELTS	Check condition and tension, service as required.	A(10)		
53	ENGINE OIL FILTER CARTRIDGE	Change cartridge.	A(3)		
54	BYPASS ENGINE OIL FILTER	Change filter element.	A(3)		
55	INTAKE VACUUM AND EXHAUST BACK PRESSURE	Check with manometer for 25 inches (50 mm) of water, maximum.	A(1), A(4)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 500 HOURS OR 2 MONTHS

FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
58 (not shown)	ALL 250 HOUR CHECKS				
59	BRAKE SYSTEM	Inspect linings, bleed brake heads.	D(2)		
60	HYDRAULIC SYSTEM RETURN FILTER	Change the filter element.	D(1)		
61	FRONT AND REAR DIFFERENTIAL BREATHER	Check breather.	C(2)		
62	TRANSFER CASE BREATHER	Check breather.	B(2)		
63	PUMP DRIVE HOUSING BREATHER	Check breather.	B(1)		
64	ENGINE CYLINDER HEAD TEMPERATURE GAUGE	Check gauge sensor for proper operation.	A (11)		
65	ENGINE FUEL INJECTORS	Inspect and clean, replace as necessary.	A(6)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 500 HOURS OR 2 MONTHS					
FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✓	COMMENTS
66	TRANSMISSION OIL SUCTION FILTER	Change filter element.	B (4)		

Signature_____

Machine No._____ Date_____

Hourmeter_____ Shift_____

2-3. PREVENTIVE MAINTENANCE SCHEDULE AND CHECKLIST

EVERY 1000 HOURS OR 6 MONTHS					
FIG. 2-1 ITEM NO.	ITEM	PROCEDURE	2-4 PARA.	✔	COMMENTS
69 (not shown)	ALL 500 HOUR CHECKS				
70	HYDRAULIC TANK	Drain and refill tank, Add HO as required.	D(1)		
71	FRONT AND REAR DIF-FERENTIALS	Drain, flush and refill. Add GO as required.	C(2)		
72	WHEEL ENDS	Drain , flush and refill, Add GO as required.	C(4)		
73	PUMP DRIVE HOUSING	Drain, flush and refill. Add EO as required.	B(1)		
74	TRANSFER CASE	Drain, flush and refill. AddGO as required.	B(2)		
75	FUEL FILTER	Change filter element.	A(2)		

Signature_____

2-4. PREVENTIVE MAINTENANCE PROCEDURES

A. ENGINE

(1) Air Cleaner and Precleaner

(a) The air cleaner prolongs engine life by removing grit and dust from the air entering the engine. Grit and dust, in combination with engine oil, will form a highly abrasive compound and can ruin the engine in a comparatively short time.

(b) It is very important that the air cleaner is checked daily and serviced according to the dust conditions. The following points should be checked on all air cleaners daily:

1. Inspect the air transfer duct between the air cleaner and the engine to be sure that all clamps are tight, all flange joints are tight and there are no cracks in the ducting.

2. Tighten the air cleaner mounting bolts and clamps that hold the air cleaner chassis.

3. Check for dents and damage to the air cleaner which could mean a leak.

CAUTION

NEVER SERVICE THE AIR CLEANER WHILE THE ENGINE IS RUNNING.

(c). A Donaldson dry type air cleaner is used on the machine. Regular scheduled maintenance is as follows:

1. When dirt reaches level indicated by arrow on the precleaner, remove the cover and lift off the plastic body and empty contents.

2. Remove dust cup, dump contents and clean. Under ordinary dust conditions, dust cup service is required only infrequently.

(d) Once a month, use a manometer to check intake air restriction, connecting it to the port provided on the air transfer duct. The manometer should indicate 25 inches (50 mm) of water, (or less) vacuum at high idle. Greater vacuum would probably mean a dirty air cleaner but may also indicate a blocked air transfer duct or other problem.

(2) Fuel System

(a) Check the fuel level daily and fill as necessary with diesel fuel of the quality specified in the Lubricant Specifications in this section. It is recommended that the fuel tank be filled at the end of each shift to avoid excessive condensation forming on the inside tank walls when the machine is not in operation.

(b) Every 125 hours, the drain plug located on the bottom of the fuel tank should be removed to drain condensate which has accumulated inside the tank.

(c) Replace the fuel filter element every 1000 hours of operation.

(3) Engine Lubrication System

(a) The engine lubricating oil level should be kept up to the "MAX" mark on the dipstick. Never let the oil level fall below the "MIN" mark. Use only EO as described in the Lubricant Specifications in this Section.

(b) The engine oil should generally be changed every 125 hours, or more often where adverse conditions prevail. Color cannot be relied upon as indicating the need for an oil change. The use of an oil analysis service is the only reason for not following the change interval specified in the Preventive Maintenance Schecule and Checklist.

(c) Every 250 hours of operation, replace the oil filter element with a new element. Also change the engine oil bypass filter element.

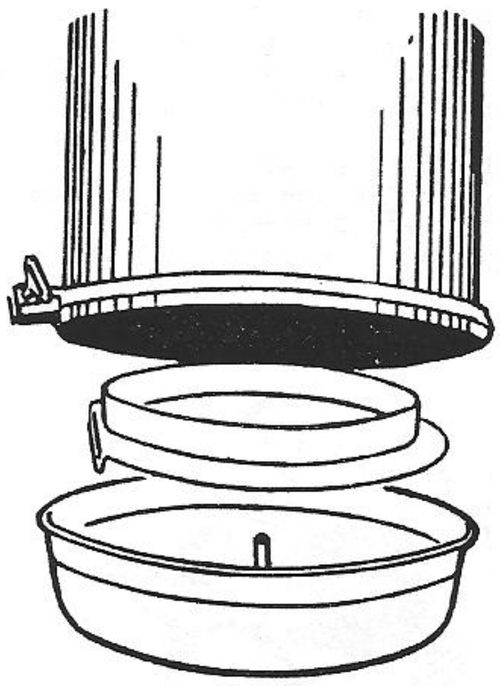
(4) Exhaust System

(a) Catalytic Exhaust Conditioner (Engelhard)

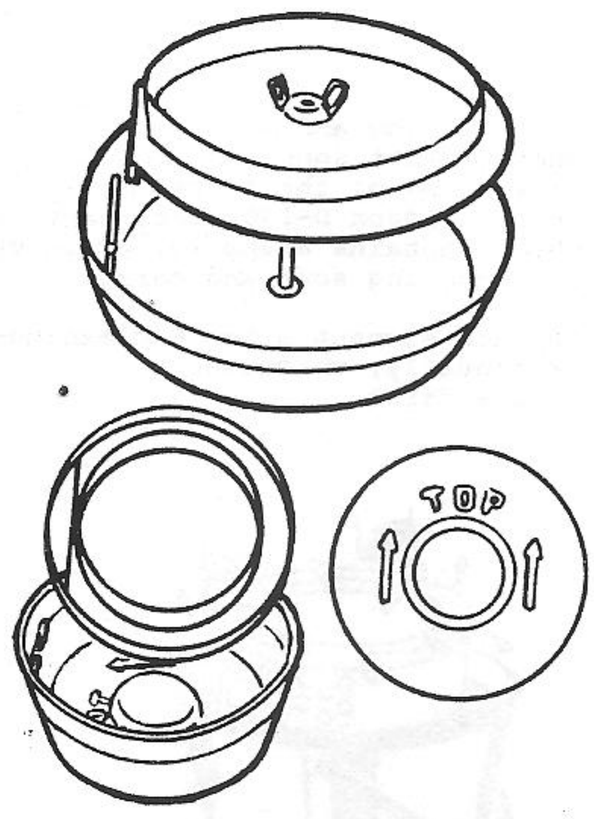
1. Once a month, use a manometer to check exhaust restriction, connecting it to the inlet cone of the purifier. The manometer should indicate 25 inches (50 mm) of water (or less) vacuum. Greater vacuum would propably mean a dirty exhaust conditioner.

2. Clean the catalytic element in Super Concentrate (GUNK) Solution, high grade of kerosene or Stoddard, S.C. Solution for one hour and dry.

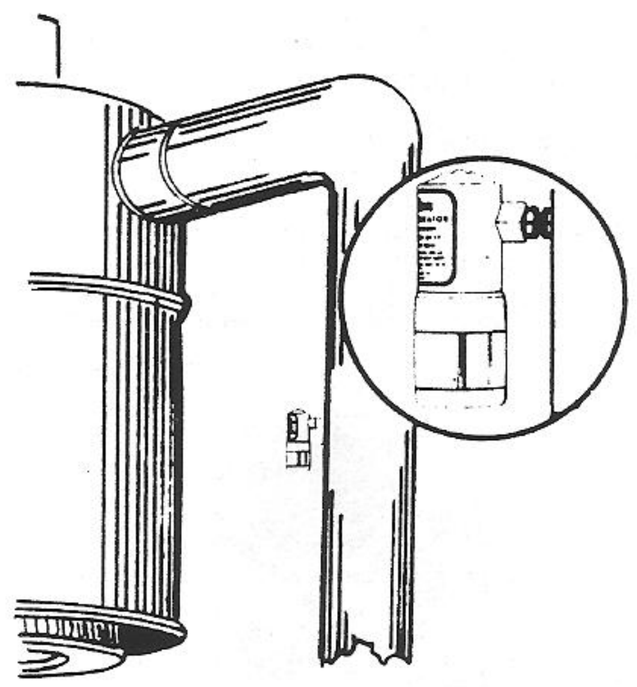
SERVICE PROCEDURE



1. Empty the dust cup as required. Dust should not be allowed to build up closer than one inch from the baffle. On vacuator valve equipped models, dust cup service is cut to a minimum; a quick check to see that the vacuator valve is not inverted, damaged, or plugged is all that is necessary.

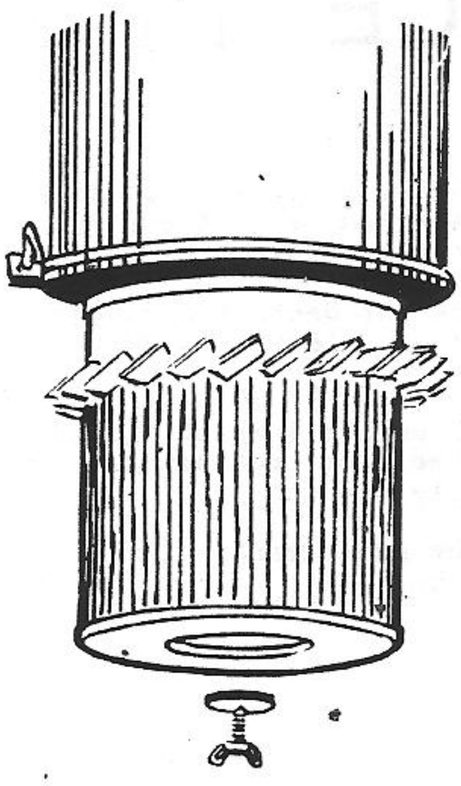


2. Stop the engine, remove and clean the dust cup. Remove the dirty primary element from the air cleaner. DO NOT REMOVE THE SAFETY ELEMENT! Wipe the inside of the air cleaner with a clean damp cloth. Check pre-cleaner fins for plugging.



3. Measure the restriction of the air cleaner with a Donaldson restriction indicator, service gauge, or a water manometer at the restriction tap provided in the air cleaner, the transfer pipe, or the blower intake. Replace or clean the element when the restriction has reached the maximum allowed by the engine or equipment manufacturer.

4. For minimum vehicle downtime, replace the dirty primary element with a new or properly cleaned filter element. Replace wing nut and tighten securely.



5. Reinstall the dust cup, making sure it seals 360° around the air cleaner body. Reset the restriction indicator to green.

6. Check all connections between the air cleaner and the engine to be certain they are tight and leak-free.

SAFETY ELEMENT SERVICE

The safety element is not intended to be cleaned. For maximum engine protection and air cleaner service life, replace the safety element with a new safety element every third primary element change.

FIGURE 2 - 2. DRY TYPE AIR CLEANER MAINTENANCE (Sheet 1 of 2)

ELEMENT CLEANING METHODS

Clean element by one of the following methods:

Compressed Air or Washing.

Compressed air is recommended when element will be re-used immediately because a washed element must be dried before re-use. However, washing does a better job and must be used when exhaust soot has lodged in fine pores of the filter media. Use Donaldson D-1400 detergent which contains a special additive for removing soot and carbon.

Replace element after 6 cleanings or annually, whichever occurs first.

Do not remove plastic fin assembly-back-flowing with compressed air or washing will remove dust from beneath the fin assembly.

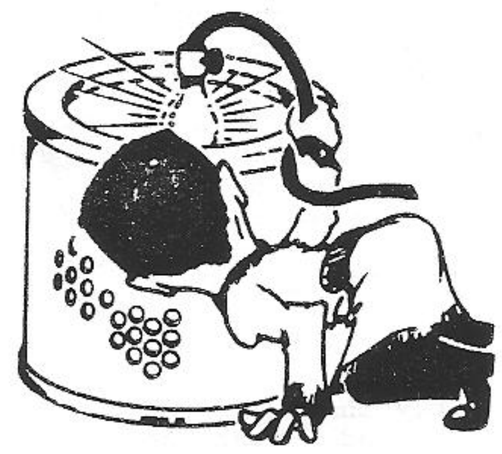
Request Form P45-7188 "How to Service Duralife® and Duralife® II Elements" for additional information.

Compressed Air

Direct air through element in the direction opposite to normal air flow through the element. Move nozzle up and down while rotating element. Keep nozzle at least one inch from pleated paper. Maximum air pressure - 100 P.S.I.

Washing

1. Soak element 15 minutes or more in Donaldson D-1400 and water solution. See carton for full instructions.
2. Rinse until water is clear. (Maximum water pressure - 40 P.S.I.)
3. Air-dry or use warm flowing air - max. 160°F. Do not use compressed air or light bulbs.



Inspection

Place bright light inside element and rotate element slowly. If any rupture holes or damaged gaskets are discovered - replace.

GENERAL SERVICE TIPS

The air cleaner should be inspected periodically to maintain maximum engine protection and maximum service life. These inspections should include the following points:

1-Inspect the air transfer duct between the air cleaner and the engine to be sure all clamps are tight, all flange joints are tight, and there are no cracks in the ducting.

2-Air cleaner mounting bolts and clamps must be tight to hold the air cleaner securely.

3-Vacuator valve must be in place, not inverted or damaged, and free from obstruction.

4-Check for dents and damage to the air cleaner which could mean a leak.

5-Make sure all inlet accessories are free from obstructions and securely mounted.

6-Check pre-cleaner fins for plugging.

FIGURE 2 - 2. DRY TYPE AIR CLEANER MAINTENANCE (Sheet 2 of 2)

(b) Waterbath Exhaust Conditioner

The waterbath exhaust conditioner (optional equipment) must be filled with water at the beginning of each eight or ten hour shift and as necessary throughout the shift. Every other shift, one-quarter cup of automatic dishwasher soap powder should be added to the water in the conditioner. Run the engine at moderate speed to agitate the water and soap in the tank, then drain the tank.

(5) Engine Valves

Every 250 hours, check engine valve clearance. All of the maintenance requirements and adjustment specifications may be found in the Deutz Instruction Manual in Section 3 of this manual.

(6) Fuel Injectors

Every 2000 hours, the injectors should be removed, washed in diesel fuel and tested for proper injection pressure. Refer to the Deutz Instruction Manual in Section 3 of this manual for more detailed instructions.

(7) Engine Cooling Fins

Every 125 hours of operation, clean the engine cooling fins and engine oil cooler. Refer to the Deutz Instruction Manual in Section 3 of this manual for more detailed instructions.

(8) Injection Pump

Every 125 hours of operation, check the oil level in the injection pump. This is not necessary when the pump is connected to the main oil circuit. See Deutz Instruction Manual for details.

(9) Fuel Lift Pump Strainer

Every 125 hours of operation, clean the fuel lift pump strainer. Refer to the Deutz Instruction Manual in Section 3 of this manual for more detailed instructions.

(10) Drive Belt Tension

Every 250 hours, check the drive belts by depressing each belt. The belt must deflect by no more than 5/32 to 1/2 inch (10-15 mm). Refer to the Deutz Instruction Manual in Section 3 of this manual for more detailed instructions.

(11) Engine Cylinder Head Temperature Gauge

Every 500 hours, check the temperature gauge sensor for proper operation. Refer to the Deutz Instruction Manual in Section 3 of this manual for more detailed instructions.

(12) Hydraulic Oil Cooler

Every 125 hours, or as required, clean the hydraulic oil cooler. Refer to the Deutz Instruction Manual in Section 3 of this manual for more detailed instructions.

(13) Engine Starter Motor

Once a year, remove the starter motor and have it inspected by a qualified automotive electric shop.

(14) Injection Pump

Have the injection pump inspected every 3000 hours by an authorized and qualified fuel injection mechanic.

B. PUMP DRIVE, TRANSFER CASE AND TRANSMISSION

(1) Pump Drive

(a) Every 125 hours, check the oil level at the oil level plug located on the lower front rim of the housing. Add oil as necessary to bring the oil level up to the oil level plug.

(b) Every 500 hours, check the pump drive housing breather to see that it is not obstructed or broken. Remove and clean as necessary.

(c) Drain, flush, and refill the pump drive housing with EO to the full level plug every 1000 hours. Refer to the Lubricant Specifications in this section for the proper oil.

(2) Transfer Case

(a) Every 125 hours, check the oil level at the oil level plug located on the front side of the transfer case. Add GO as necessary to bring the oil up to the oil level plug.

(b) Every 500 hours, check the transfer case breather to see that it is not obstructed or broken. Remove and clean as necessary.

(c) Drain, flush and refill the transfer case with GO to the full level plug every 1000 hours. Use GO as specified in the Lubricant Specifications.

(3) Flywheel Housing

Every 250 hours, remove the plug from the bottom of the flywheel housing and check for oil leakage. Leakage indicates that the flywheel housing drive shaft seal needs replacement.

(4) Transmission Suction Filter

Replace the transmission suction filter after the first 50 hours and every 500 hours thereafter. Remove the filter shell by unscrewing the cap screw in the filter shell.

(5) Transmission High Pressure Line Filter

Replace the filter element when the warning indicator on the filter assembly pops out.

C. DRIVELINE AND AXLES

(1) Driveline

Every 125 hours, lubricate 3 fittings on the driveline with MPG. The front and rear frames of the machine must be straight in line before lubricating the slip joint.

(2) Front and Rear Differentials

(a) Every 125 hours, check the front and rear differential oil level with the machine setting on level ground. Remove the plug from the center of the differential housing. The oil level is satisfactory if it is within 1/2 inch (12 mm) of the bottom of the fill plug.

(b) The oil is changed as follows:

1. Remove the plug from the bottom center of each differential and drain the oil.

2. Reinstall drain plug. Remove the filler and check level plugs from the differential.

3. Fill differential until oil comes out from the check level plug opening. Reinstall plugs. See Lubricant Specifications for correct gear oil.

(c) Every 500 hours, check the front and rear differential breather for damage and obstruction.

(3) Tires and Wheels

(a) Check the tire pressure daily. Maintain a tire pressure of 80 PSI (5.5 bars). Also inspect the tires for cuts, breaks or other damage.

(b) Inspect the wheel lug nuts every 250 hours of operation. Each time a wheel has been removed, check the lug nuts daily for 50 hours. This is necessary as lug nuts may loosen during operation. If lug nuts have become loose, check on a daily basis until satisfied that they will remain tight. Refer to the Preventive Maintenance Schedule for the proper lug nut torque specifications.

(4) Planetary Wheel Ends

(a) To check the planetary wheel ends, position each wheel so that the small plug in the case slot on the wheel end cover is down. Remove the plug. The oil level should be within 1/2 inch (12 mm) of the plug opening.

(b) Every 1000 hours, change the oil as follows:

1. Move the machine backward or forward as necessary to position the drain plug for each wheel end at the bottom of the wheel end. Remove the drain plug and drain the wheel end.

2. Reinstall the drain plug. Remove the filler and check level plugs from the wheel end.

3. Fill the wheel ends until oil comes out from the check level plug opening. Reinstall the plugs.

CAUTION

AVOID SPILLING LUBRICANT ON TIRE AS DETERIORATION OF THE RUBBER WILL RESULT.

(5) Rear Axle Bolster

Daily or at the discretion of the maintenance personnel, lubricate 1 fitting on the rear axle bolster with MPG specified in the Lubricant Specifications in this manual.

D. HYDRAULIC SYSTEM

(1) Hydraulic Tank

(a) The bucket control system, steering system, and transmission all share the same oil tank.

The oil level should be even with the sight gauge on the front of the tank. Check the oil level only when the oil is at normal operating temperature and the bucket is lowered and completely rolled back.

(b) Every 1000 hours, remove the drain plug from the bottom of the hydraulic tank and drain the oil. Clean the tank suction strainer.

Reinstall the plug and refill the tank to the sight gauge (see the Lubricant Specifications in this section for correct oil to use).

(c) Every 500 hours, remove the hydraulic system return filter canister and replace the element with a new 10 micron element.

(2) Brake System

(a) Replace the brake pads when they are worn to within 1/8 inch (3 mm) thickness. Always open the bleeder valve before removing the pads. This is necessary to relieve hydraulic pressure on the pads.

CAUTION

NEVER APPLY THE BRAKES WHEN THE DISC PADS ARE REMOVED AS THE PISTONS MAY MOVE FAR ENOUGH TO DAMAGE THE SEALS. IF THIS SHOULD HAPPEN, THE ENTIRE CALIPER MUST BE REMOVED AND REBUILT.

(b) Bleed the brakes. Note that each brake has two bleeder valves. On some machines the wheel must be removed to gain access to the outer valve. Keep both brake system reservoirs full of fluid.

(c) Refer to Section 6-4 of this manual for brake system bleeding instructions.

E. ELECTRICAL SYSTEM

(1) Battery

Check the electrolyte level in each cell of the battery. If the electrolyte level is low, top off with distilled water only.

F. FRAME PARTS / LOADER ASSEMBLY

(1) Bucket Cutting Lip

Check the condition of the bucket cutting lip daily. The condition of the cutting lip affects loading efficiency greatly. A manganese-steel cutting lip is used. For repair welding, use an AMSCO MICROMANG welding rod (or equivalent), S.A. wire of similar alloy or a stainless steel rod. The composition on an equivalent electrode must be: Carbon .75%; Manganese 14% (min.); Nickel 3.5% (min.).

G. GENERAL

(1) Fire Extinguisher

(a) Verify that the fire extinguisher indicator needle is in the white zone.

(b) The fire extinguisher should be serviced only by authorized and certified personnel.

(2) Machine Cleaning

NOTE

IF POSSIBLE, PARK THE MACHINE SO THAT THE BOTTOM OF THE MACHINE IS EXPOSED FOR STEAM CLEANING AS WELL AS THE TOP. WHEN STEAM CLEANING, PROTECT THE FACE OF THE INSTRUMENT PANEL.

(a) After 50 hours of operation, steam clean the entire machine.

(b) Remove all plates and open all access doors to the engine area. Throughly steam clean the engine and all components.