

Warner Swasey
**Service, Part, &
Operator's Manual**

HOPTO 345A & 500

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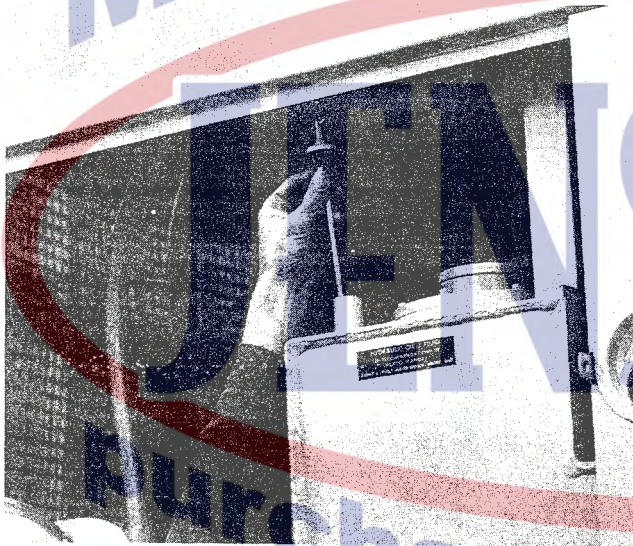
Adding Oil To Reservoir

Always use the same brand of oil and avoid mixing different types of oil. Funnels and pails used to add oil must be clean.

1. Wipe all dirt from the top of the reservoir.
2. Remove the oil filler cap.
3. Add oil to the proper level as indicated on the dip stick. Do not over fill. The volume of hydraulic oil increases 10% when the oil temperature rises 100F.
4. Replace filler cap.



Inspect oil filters regularly.



Check hydraulic oil level with dip stick.



Replace return line filter every 200 hours.

Reusable Filter Elements

Reusable filter elements are located in the reservoir. Every 30 days the elements should be removed and washed.

1. Wipe all dirt from the top of the reservoir.
2. Position the machine with the boom raised and the stick out. This reduces the oil level in the reservoir.
3. Remove the filter assemblies from the reservoir.
4. Remove the elements from the assemblies.
5. Wash elements in kerosine and allow to dry thoroughly.
6. Reassemble.



Replace reservoir vent filter every 200 hours.

Air Breathers

Air breathers are located on the top of the reservoir. They should be inspected when the filters are inspected. When an air breather is dirty, it should be removed, washed with kerosine, oiled and replaced.



Clean air breather when dirty.

Instruments

The following instruments are recommended when servicing hydraulic equipment. Your nearest BADGER distributor can help you select satisfactory units.

Hydraulic Pressure Gage

This gage is a standard item in the tool kit. It reads from 0 to 3000 psi. Many servicemen prefer to use it with a 10 foot long hose extension. The hose buffers small fluctuations in pressure and allows the mechanic to hold the gage in the cab during tests. Occasionally the accuracy of the gage should be checked by comparing the readings with a new gage.

Engine Tachometer

This gage indicates engine speed. The engine must be set to the proper rpm in order to evaluate pump pressure and volume readings.

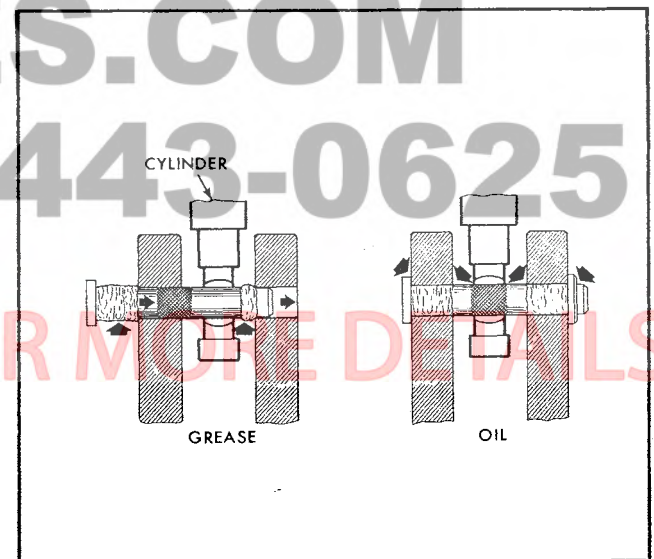
Hydraulic Flow Meter

This instrument measures pump efficiency in both pressure and volume. The output of a pump can be measured under no-load and actual operating conditions.

Pin Lubrication

Pins must be lubricated before installation.

1. Partially install the pin.
2. Apply lubricant as shown.
3. Finish installing the pin and assemble the pin retainer.
4. Apply a few drops of light weight oil as shown. Capillary attraction between the metal surface and the grease will draw the oil into the joint. Occasionally adding a few drops of oil will keep the pin working freely.



Lubricate pin before installing.

CLICK ANYWHERE FOR MORE DETAILS

MAINTENANCE PROGRAM

5 HOURS	10 HOURS	50 HOURS	BI-MONTHLY	YEARLY	DESCRIPTION
X					Lubricate Turntable Bearings.
	X				Lubricate as recommended in upperstructure and crawler charts.
	X				Clean machine.
	X				ENGINE: Check gas and oil level. Check radiator water level. Lubricate (See Engine Manual).
	X				Hydraulic Reservoir: Check oil level. Clean strainer and magnet. Clean and oil breathers.
			X		Check Engine clutch adjustment.
	X				Check pumps, motors and hoses for external leakage.
		X			Check battery water level.
		X			Check cylinder rod packing.
		X			Check air and oil filters in Engine.
		X			Check Swing Transmission oil level.
		X			Grease Swing Bull Gear and Pinion.
			X		Check Engine for correct RPM.
			X		Spot check multiple pump bolts, motor bolts, flow divider bolts, swing trans. bolts, main tie-down bolts, track pad bolts. Refer to torque chart.
			X		Check pump pressure and volume.
			X		Inspect clutch bearings.
			X		Check Control Valves relief pressures.
			X		Check linkage adjustment in levers, pedals, and control valves.
			X		Check Bucket operating shaft. Keep teeth sharp.
			X		Replace Reservoir gaskets and clean tanks. Replace Hydraulic Oil.
			X		Inspect Pumps and Motors for internal wear and rebuild.
			X		Rebuild Hydraulic Cylinders.
			X		Examine all bushings, pins. Make sure all cotter pins and grease fittings are in place.

CLICK ANYWHERE FOR MORE DETAILS

The above schedule is a guide to good scheduled maintenance. However, frequency of checking and lubricating may have to be increased under certain conditions. Also, additional points may need attention. Some machine models are equipped with optional accessories. Learn their maintenance requirements. Refer to Lubrication Chart for grease and oil specs.

The transmission of power from the swing hydraulic motor passes through a series of two bevel gears and six reduction pinion gears.

The gears and bearings should be protected with gear lube-MULTI-PURPOSE E. P. #140 LUBRICANT (MIL-L-2105 SPECIFICATIONS).

A dip stick is located on the top side of the transmission to use when checking oil level. Grease fittings are provided for the lubrication of the bearings and swing bull gear.

Read entire Scheduled Maintenance section for detailed lubrication instructions.

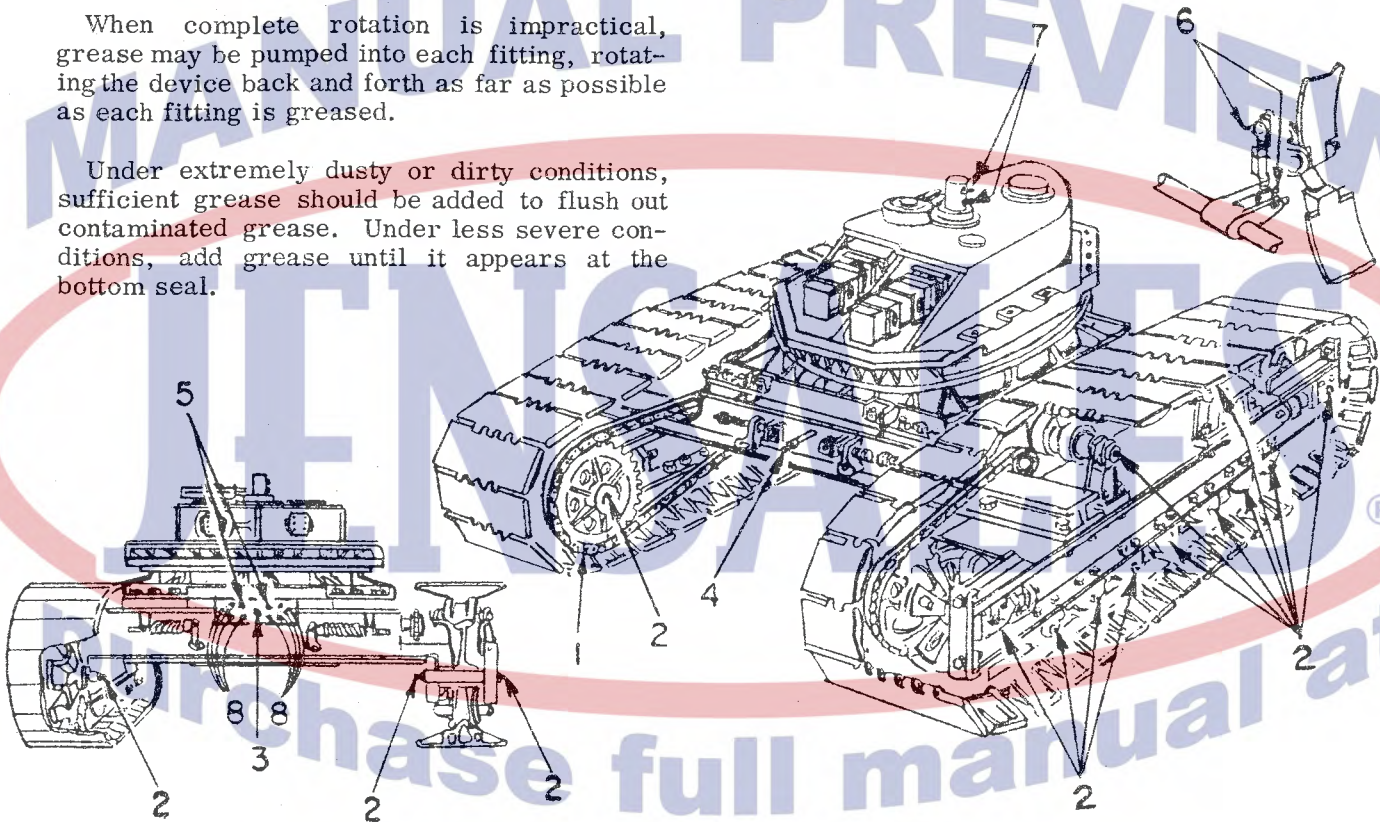
NOTE: Fittings as shown may be piped from a central panel.



Each Turntable Roller Bearing is equipped with one or more grease fittings. Add grease every 100 operating hours. It is necessary to distribute the grease around the race. This can be done by injecting grease through one fitting as the machine is rotated. Rotate at least two complete revolutions.

When complete rotation is impractical, grease may be pumped into each fitting, rotating the device back and forth as far as possible as each fitting is greased.

Under extremely dusty or dirty conditions, sufficient grease should be added to flush out contaminated grease. Under less severe conditions, add grease until it appears at the bottom seal.



Item No.	No. of Points	Location	Lubricant	Hours
1	2	Drive Chain	Oil SAE-10	40
2	24	Track Rollers & Idlers	Grease*	8 or every 3 miles†
3	1	Bevel Drive Gears	Grease*	8 or every 3 miles†
4	1	Spur Drive Gears	Grease*	8 or every 3 miles†
5	2	Steering Clutches	Grease*	8
6	4	Brake Uniballs	Grease*	40
7	2	Air Center Pin	Grease*	40
8	8	Car Body Bearings	Grease*	8 or every 3 miles†

*Grease--Lithium Base Extreme Pressure Lubricant No. 2 Consistency
†Every 3 Miles When Traveling