



Caterpillar
Service Manual
Holt 45
Crawler

Service Manual

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CT-S-HOLT 45

Care and Operation

of the

“CATERPILLAR”

T. M. Reg. U. S. Pat. Off.

45 TRACTOR



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The Holt Manufacturing Company

Incorporated

Stockton, California

Peoria, Illinois

CARE AND OPERATION

engine cools, the vapors of the fresh and compressed charge will condense, fall on the piston heads, may gain admission past the piston rings and ultimately find their way into the lubricating oil supply in the crankcase. *To keep the engine in perfect shape and to make easy starting, do not kill the engine on the magneto but close off the fuel line supply to the carburetor.*

34 — Turn off oil on tracks if running.

35 — In freezing weather, DRAIN RADIATOR, CYLINDERS AND PUMP. This is a very important matter. Your neglect to do this may cause serious and costly damage. The water, if left in the cylinders, may freeze and crack them open. Plugs are provided at the bottom of the water jacket on the magneto side of the engine to drain the water jacket entirely. When draining an engine, the operator should revolve it several times by hand in order to allow the head of water held by the centrifugal pump to be released. See paragraphs 206 to 212 on the care of the radiator.

Lubrication

36 — Proper lubrication is the most important point that the tractor operator must consider, because upon this factor depends the life and efficiency of the tractor. IF LUBRICATING AGENTS OF THE PROPER GRADE ARE NOT SELECTED FOR THE DIFFERENT REQUIREMENTS OF THE TRACTOR, A HIGH STATE OF MECHANICAL AND COMMERCIAL EFFICIENCY CANNOT BE OBTAINED. THE HIGHEST REFINEMENT OF MANUFACTURING SKILL TO PRODUCE LONG LIFE IN THE FINISHED PRODUCT OF PARTS CAN BE TOTALLY UNDONE IN THE USE AND SELECTION OF THE WRONG LUBRICATING AGENTS. IF OILS AND CUP GREASES ARE NOT KEPT CLEAN THE BEST OILS AND GREASES WILL FAIL TO GIVE SATISFACTION.

Friction

37 — *Friction is a conversion of useful work into useless heat accompanied by wear.* Friction can never be entirely eliminated in any mechanism, but by the use of suitable lubricating agents it can be reduced to a minimum.

38 — A complete statement of friction is not within the province of this Care & Operation Book, as it is a very large subject in itself. Friction is divided into two general classes: starting (static) and moving (kinetic) friction, and further divided into the friction of solids (external) and the friction of liquids (internal).

39 — Lubrication is the introduction of a smooth fluid or semi-fluid substance such as oil or grease between two moving surfaces to prevent solid friction, that is, to prevent the two metal surfaces from coming into direct metallic contact. *When moving parts are separated by a lubricant, friction then takes place within the liquid itself (internal friction).* The significance of the part played by internal friction of the oil or lubricating agent is probably least understood by the tractor operator. It is the lack of understand-

ing of this subject that causes the tractor operator to select the wrong type of cylinder oil and frequently the wrong lubricant for the transmission and other bearings. A light-bodied cylinder oil has an internal friction value different from that of a heavy-bodied cylinder oil. Cylinder oil that is right for a water-cooled engine has an internal friction value different from that of the oil suitable for an air-cooled engine, yet the latter is sometimes used in a water-cooled engine. The operator of a “Caterpillar” Tractor, however, has at his disposal results of exhaustive tests of oils which have enabled him to have the right body, together with low internal friction value, in “Caterpillar” Cylinder Oil.

- 40 — *The ideal condition of lubrication is to have a thin film of oil separating the sliding surfaces and circulating through the bearing fast enough to carry away the heat generated.*

Requirements of the “Caterpillar” Tractor

- 41 — The kinds of oil required in the various parts of the “Caterpillar” Tractor are different. The oil that is used in the crankcase for cylinder lubrication must withstand high operating temperatures of the cylinders, and while lubricating the crankshaft and crank pin bearings must stand very heavy pressures under fairly high speeds; the oil used in the transmission must stand very heavy pressures under low speeds in order not to squeeze out and allow the teeth of the gears to come into metallic contact; the oil for the magneto must be a light oil to lubricate the ball bearings properly; the grease for the cups at the various parts must be a straight lubricating agent containing oil only and must not contain a filler either of vegetable, such as fiber or resin, or mineral, such as mica or graphite.

Care of Lubricating Oil

- 42 — *The first duty of a “Caterpillar” Engineer is to keep his supply of lubricating oil and greases scrupulously clean. The least trace of dirt or grit introduced into a bearing causes cutting of the surfaces and undue wear. A valve grinding compound is all right in its proper place, but it is not a lubricant in any sense of the word. Dirty oil and grease must be considered a grinding or cutting compound. An engineer should be sure that all his containers into which he pours the oil are scrupulously clean and free from dust or grit. The crankcase doors of the engine should always be wiped clean with a rag or piece of waste saturated with kerosene before removing to fill the crankcase with a new supply of oil. Sleeves should be brushed off so that no dirt will fall off from the clothing into the oil. All wrenches and bars used in the crankcase of the engine must be rinsed with distillate before working on the connecting rod or crankshaft bearings, thus minimizing the possibility of putting dirt into the oil. Water circulation should be effectively maintained at all times as scoring will result if the excess heat is not carried away. Cylinder oil is never intended to perform the function of circulation water.*

Care of Cup Grease

- 43** — The operator must be careful never to allow the cup grease to get contaminated with dirt. *The one great consideration in using cup grease is to keep the cup grease in the bearing and the dirt out.* There are several grades of cup grease on the market ranging from a very stiff fiber grease to very soft bodied greases. A cup grease that is filled with fiber, mica or graphite is not recommended for use in any part of the “Caterpillar” Tractor, for the reason that in time under the action of heat these mineral or vegetable substances will be precipitated out and will clog the grease grooves and prevent the effective distribution of the new grease. “Caterpillar” Cup Grease has been especially developed for this tractor and its use in all grease cups is recommended. Cup grease should not be carried in an open container on the deck of the tractor. Keep cup grease covered.

Lubricating Chart

44 — PART	LUBRICANT	HOW APPLIED	HOW OFTEN
Fan shaft	Cup grease	2 grease cups.....	Two turns per hour.
Magneto shaft	Cup grease	2 grease cups.....	Two turns per hour.
Magneto	3-in-1 or Household Lubricant	Dropper	See par. 177 and 194.
Valve stems	½ Kerosene		
	½ Cylinder Oil.....	Oil can	Four times per day.
Rocker arms	Cylinder Oil	Oil can	Two times per day.
Governor	Cylinder Oil	Oil can	Two times per day.
Crankcase	“Caterpillar” Cylinder Oil	Oil filler	When required.
Mechanical oiler	“Caterpillar” Cylinder Oil	Reservoir	When required.
Air valve stem in carbureter	Cylinder Oil	Oil can	Two times per day.
SKF bearing in master clutch	Cup grease	1 grease cup.....	Two turns per day. If stationary work is being done give 1 turn per hour.
Master clutch discs.....	Cylinder Oil	Oil can	Two times per day.
Master clutch shifting ring	Cup grease	1 grease cup.....	Two turns per hour.
Master clutch dogs.....	Cylinder Oil	Oil can	One time per day.
Transmission	“Caterpillar” Transmission Oil ...	Oil filler	As required to maintain correct level.
Transmission bearings..	Cylinder Oil	3 oil cups.....	Fill every two hours.
Transmission bearings..	Cup grease	2 grease cups.....	Two turns per hour.
Shifter collar on steering clutch*	Transmission Oil ...	Grease gun	¼ pint every other day.