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GENERAL DESCRIPTION

The Model "HD-9" Tractor is an 18,800 pound track-type tractor powered with a 4 cylinder, 2 cycle "DIESEL" engine.

Power from the engine is transmitted through a single plate, over-center type clutch to the transmission through a universal joint drive shaft assembly. From the transmission the power is transmitted to the bevel gear and from the bevel gear through the steering clutches to the final drives and the track drive sprockets.

The transmission provides 6 forward speeds ranging from 1.4 M.P.H. in low gear to 5.7 M.P.H. in high gear, and 3 reverse speeds ranging from 1.6 M.P.H. in low reverse to 4.4 M.P.H. in high reverse, under full governed engine speed of 1600 R.P.M.

Mechanical "Booster Type" steering clutch controls, mechanical self energizing brakes, wide operator's seat and unobstructed vision of the front of both tracks assure easy, positive control of the tractor at all times.

The tractor is equipped with electrical starting and lighting equipment, muffler, full width crankcase guard, front pull hook, bumper, hinged radiator guard. The truck wheels, track idlers, and support rollers have positive type seals and are protected by guards.



Model HD-9 Tractor

FIG. 1

COOLING SYSTEM

A. Description of System

The cooling system includes the water pump, radiator, oil cooler, thermostat, cooling fan and water passages in the cylinder block and head. The pump draws the water from the bottom of the radiator and circulates it through the oil cooler housing and the water passages in the engine. The water is discharged from the cylinder head and passes through the thermostat housing and upper radiator hose to the upper part of the radiator. The water is cooled as it passes from the top to the bottom of the radiator by air passing through the radiator core from the cooling fan.

The thermostat, located in the housing on the front of the water outlet manifold of the engine, operates automatically to maintain a normal engine operating temperature (160° to 185° F.).

B. General Maintenance

Keep the cooling system filled with clean water which is free from lime or alkali. The use of water containing lime, will result in lime deposits in the cylinder head and block, causing hot spots in engine and eventually restricting the water passages. Alkali in the water will cause a corrosive action detrimental to the engine.

In winter weather use an ethylene glycol anti-freeze solution in the system to protect against damage from freezing. This type of anti-freeze has a much higher boiling point than water. After any addition of water or anti-freeze compound, test the solution after the added quantity has become thoroughly mixed to assure its withstanding the prevailing or anticipated temperature. A mixture of 60% ethylene glycol and 40% water will provide maximum protection; the use of more than 60% ethylene glycol in the solution will raise the freezing point and provide less protection against freezing.

Keep the radiator air passages free from leaves, trash and other material which will restrict the flow of air through the radiator. All leaks in the cooling system must be corrected as soon as they are evident and the fan belts must be kept properly adjusted. The most efficient engine operation is obtained with the temperature held within a range

of 160° to 185° F. Operating the engine with temperature below this range will result in incomplete combustion of fuel, higher fuel consumption with less power, and will cause harmful deposits within the engine.



FIG. 9



FIG. 10

Maintaining the normal engine temperature (160° to 185° F.), depends mostly on proper functioning of the thermostat. If the engine temperature remains consistently below normal, the thermostat should be removed and inspected. If the thermostat is corroded or stuck or if the bellows of unit leaks, install a new unit.

position, it will prevent the air shut-off valve from bottoming in the air inlet elbow when the shut-off control rod is pulled out to stop the engine.

2. To adjust the governor fuel shut-off control, push the engine shut-off control rod into the running position (all the way in) and remove the pin connecting the governor fuel shut-off rod to the governor fuel shut-off lever. Hold the governor fuel shut-off lever all the way back (towards the cowl) as far

as it will go and check to see if the hole in the fuel shut-off rod lines up with the hole in the fuel shut-off lever. If not, loosen the cap-screw clamping the governor fuel shut-off lever to the shaft, and move the position of the lever on the shaft so that the holes line up when the lever is all the way back. Tighten the capscrew used to clamp the lever to the shaft securely; then install the control rod pin and the cotter pin.

GOVERNOR ADJUSTMENT

A. General

The governor is adjusted at the factory to provide the full governed speed (under load) of 1600 R.P.M. and an idling speed of 500 R.P.M. The governor very seldom gets out of working order. If the engine speed is irregular, check the fuel system and all other engine adjustments before changing the governor setting.

B. Checking Engine Speed

Operate the engine until the normal operating temperature (160° to 185° F.) is indicated on the temperature gage. Hold a tachometer against the front end of the crankshaft. With the throttle all the way forward (idling position) and with the engine clutch disengaged, the engine speed should be 500 R.P.M. With the throttle lever all the way back (wide open) the engine speed should be ap-

proximately 125 R.P.M. above the full load governed speed, or 1725 R.P.M.

NOTE: If equipment on the tractor prevents the use of a tachometer at the front end of the crankshaft, remove the small cover plate at the rear end of the generator and hold the tachometer against the rear end of the armature shaft. The generator runs at 1.7 times the engine speed. Therefore, the generator speed of 850 R.P.M. and 2932 R.P.M. will correspond with the engine speeds of 500 R.P.M. and 1725 R.P.M. Be sure that the generator belt is properly adjusted when checking the engine speed at the generator.

C. Spring Plunger Gap Adjustment

A clearance of .006" must be maintained between the variable spring plunger and the guide. To adjust, remove the control housing cover and pull the

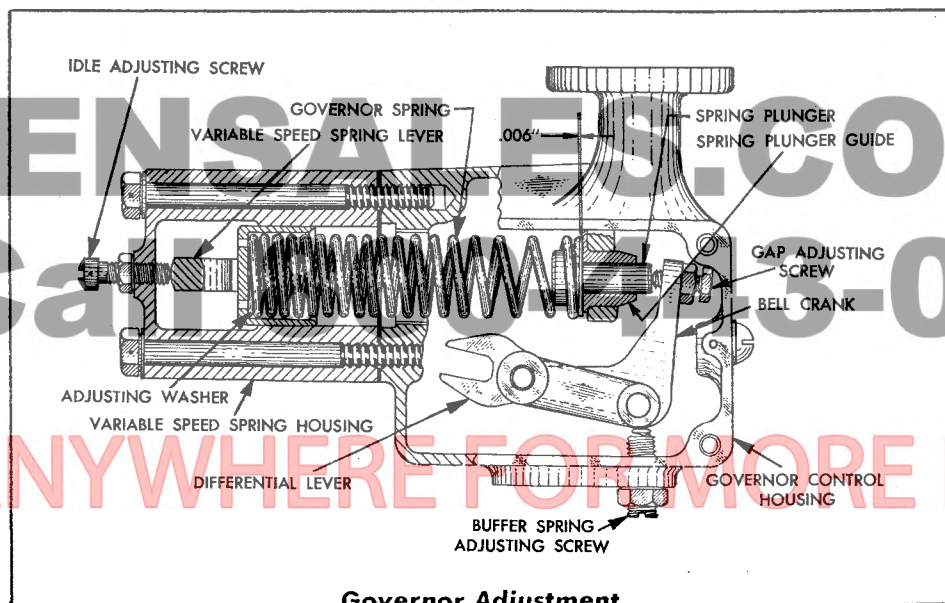


FIG. 31

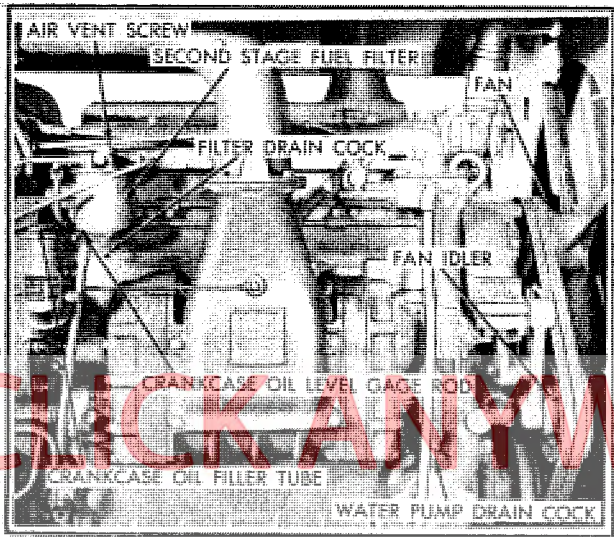


FIG. A

CRANKCASE OIL LEVEL GAGE ROD—10 Hour Service. Check oil level and add oil if necessary to raise level to "FULL" mark on gage rod.

CRANKCASE OIL FILLER TUBE AND DRAIN PLUG—75 Hour Service. Change oil. Operating conditions may necessitate this service at shorter intervals. Remove the small plate in the bottom of the crankcase guard to reach the drain plug. Remove the drain plug and allow the oil to drain, reinstall and tighten the drain plug, and reinstall the plate in the crankcase guard. Fill the crankcase with new oil to the "FULL" mark on the gage. Refer to "Specifications of Lubricants" on this chart. Cap. 4 Gal.

SECOND STAGE FUEL FILTER—10 Hour Service. Open the air vent at top of filter, then open the filter drain cock before the engine is started at the beginning of an operating period, and allow the water and sediment to drain. Close the drain cock and the air vent when clean fuel runs out. In freezing weather, drain at the end of an operating period.

FAN—200 Hour Service. 1 Lube fitting. Lubricate with pressure gun lubricant.

FAN IDLER—200 Hour Service. 1 Lube fitting. Lubricate with pressure gun lubricant.

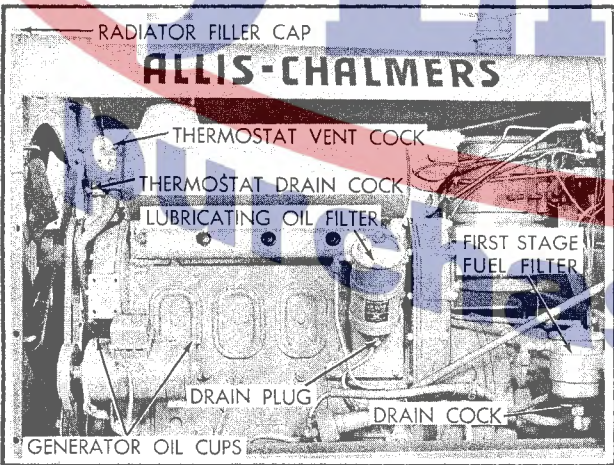


FIG. B

FIRST STAGE FUEL FILTER—10 Hour Service. Open the filter drain cock before the engine is started at the beginning of an operating period and allow the water and sediment to drain. Close the drain cock when clean fuel runs out. In freezing weather, drain at the end of an operating period.

LUBRICATING OIL FILTER—75 Hour Service. Drain filter shell, remove old element, clean shell, and install new element kit.

GENERATOR OIL CUPS—200 Hour Service (2 oil cups on early models—1 Oil cup on later models.) Lubricate with 10 drops of light engine oil in each oil cup.

RADIATOR FILLER CAP—10 Hour Service. Check level of coolant and add if necessary. Keep the system filled with clean soft water or anti-freeze solution.

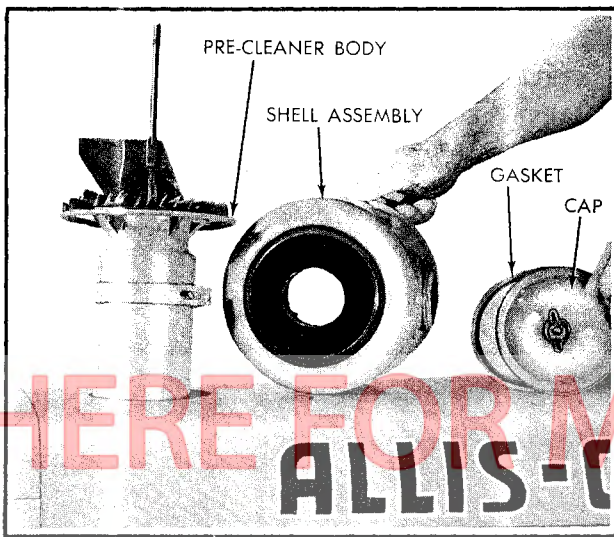


FIG. C

AIR PRE-CLEANER—10 Hour Service. Empty the dirt from shell when level reaches half-way up on the inspection glass. Remove the cap, lift the shell from the body, and clean the shell thoroughly. Reinstall the shell, gasket, cap, and tighten the wing nut. Make certain that the gasket is in good condition and properly installed.



FIG. D

AIR CLEANER—10 Hour Service. Remove the oil cup from bottom of cleaner and inspect condition and level of oil. If oil is discolored or there is a layer of dirt in cup and on the baffle, the oil must be changed. Empty the oil cup, wash, and clean the cup and baffle thoroughly. Make certain that the oil cup gasket is in good condition and properly installed. Refill with the specified oil to the top of cone in the center of baffle and maintain the oil at this level. Cap. 1 gal. Refer to "Air Cleaner" in "OPERATORS MANUAL" for detailed information.

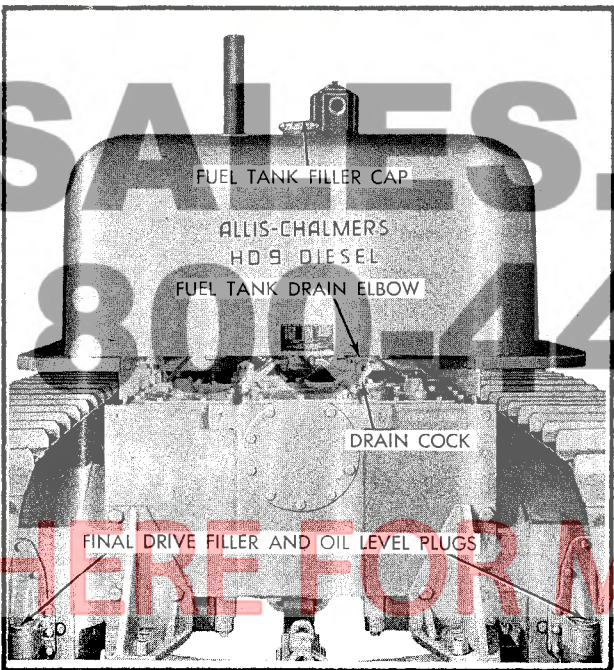


FIG. E

FUEL TANK DRAIN ELBOW AND DRAIN COCK—10 Hour Service. Open the drain cock in the elbow before the engine is started at the beginning of an operating period and allow the water and sediment to drain. Close the drain cock when clean fuel runs out. In freezing weather, drain at the end of an operating period.

FUEL TANK FILLER CAP—10 Hour Service. Fill the tank at the end of each operating period to keep condensation in the tank to a minimum.

FINAL DRIVE FILLER AND OIL LEVEL PLUGS—75 Hour Service. 1 Plug each side. Check oil level and add oil if necessary to raise level even with filler plug opening.

FINAL DRIVE OIL DRAIN PLUGS (Shown in Fig. 1)—1000 Hour Service. 1 Plug each side. Change oil. Climatic or operating conditions may require this service at shorter intervals. Remove each drain plug and allow oil to drain. Reinstall and tighten each drain plug. Fill each final drive through oil filler plug opening to level even with opening. Use the specified lubricant for the prevailing air temperature. Cap. 3 1/4 Gal. each.



FIG. F

ENGINE CLUTCH:

CLUTCH SHIFTING BEARING—75 Hour Service. 1 Lube fitting. Lubricate with pressure gun lubricant. CAUTION: DO NOT LUBRICATE EXCESSIVELY.

CLUTCH SHIFTING SLEEVE—200 Hour Service. 1 Lube fitting. Remove the clutch inspection plate to reach fitting. Lubricate with pressure gun lubricant. NOTE: For accessibility, the shifting sleeve has 4 lube fittings (equally spaced around sleeve). Lubricate the sleeve through any 1 of these fittings.

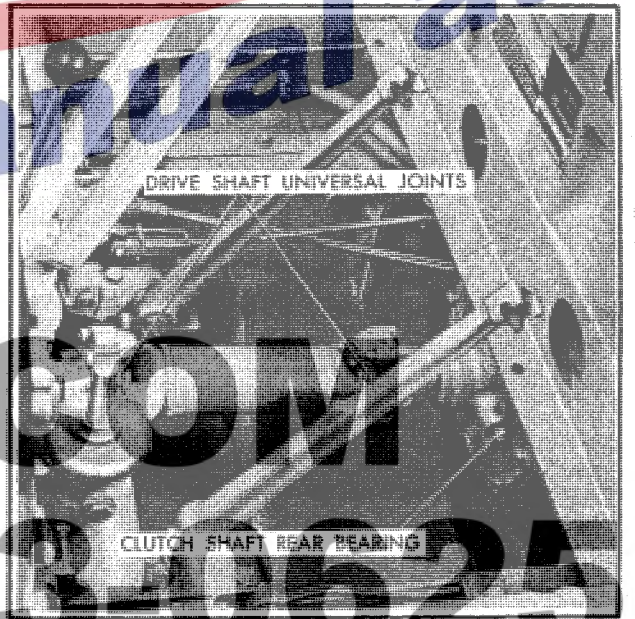


FIG. G

CLUTCH SHAFT REAR BEARING—200 Hour Service. 1 Lube fitting. Lubricate with pressure gun lubricant.

DRIVE SHAFT UNIVERSAL JOINTS—1000 Hour Service. 2 Lube fittings. Remove the floor plate to reach the lube fittings. Lubricate with pressure gun lubricant.