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340/460/560/660 Diesel Tractor

Operators Manual

1014230R7

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INTRODUCTION

Preventive Maintenance for the Farmall 340 Diesel, Farmall 460 Diesel Series, Farmall 560 Diesel Series, International 340 Diesel Utility and Industrial Series, International 460 Diesel Utility and Industrial Series, International 560 Diesel, and International 660 Diesel Tractors is presented in this manual.

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This symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about your safety. Carefully read the message. Make sure you fully understand the causes of possible injury or death. SB001

IF THIS MACHINE IS USED BY AN EMPLOYEE, IS LOANED, OR IS RENTED, MAKE SURE THAT THE OPERATOR UNDERSTANDS THE TWO INSTRUCTIONS BELOW.

BEFORE THE OPERATOR STARTS THE ENGINE:

1. GIVE INSTRUCTIONS TO THE OPERATOR ON SAFE AND CORRECT USE OF THE MACHINE.
2. MAKE SURE THE OPERATOR READS AND UNDERSTANDS THE OPERATOR'S MANUAL FOR THIS MACHINE.

WARNING

IMPROPER OPERATION OF THIS MACHINE CAN CAUSE INJURY OR DEATH.

BEFORE STARTING THE ENGINE, DO THE FOLLOWING:

1. READ THE OPERATOR'S MANUAL.
2. READ ALL SAFETY DECALS ON THE MACHINE.
3. CLEAR THE AREA OF OTHER PERSONS.

LEARN AND PRACTICE SAFE USE OF MACHINE CONTROLS IN A SAFE, CLEAR AREA BEFORE YOU OPERATE THIS MACHINE ON A JOB SITE.

It is your responsibility to observe pertinent laws and regulations and to follow manufacturer's instructions on machine operation and maintenance.

See your Authorized Case dealer for additional operator's manuals, parts catalogs, and service manuals.

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Lubrication Table

Point of Lubrication	Capacity										Anticipated Air Temperature and Lubricant Required			
	Farmall 340 Diesel	International 340 Diesel Utility and 340 Diesel Industrial	Farmall 460 Diesel	Farmall 460 Diesel Hi-Clear	International 460 Diesel Utility and 460 Diesel Industrial	International 460 Diesel Hi-Utility	Farmall 560 Diesel	Farmall 560 Diesel Hi-Clear	International 560 Diesel	International 660 Diesel	Above +45°F.	+45°F. to +10°F.	+10°F. to -10°F.	Below -10°F.
Engine crankcase	7 qt.	7 qt.	9 qt.	9 qt.	9 qt.	9 qt.	9 qt.	9 qt.	9 qt.	9 qt.	SAE-30	SAE-10W	SAE-10W with 10% Kerosene	SAE-10W with 20% Kerosene
Air cleaner oil cup	1-1/2 pt.	1-1/2 pt.	2-1/4 pt.	2-1/4 pt.	2 pt.	2 pt.	2 pt.	2 pt.	2 pt.	2 pt.			SAE-10W	SAE-10W
Oil pump shaft support	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	Chassis lubricant			
Generator	xx	xx	xx	xx	xx	xx	xx	xx	xx	xx	SAE-20 engine oil			
Steering gear housing											IH Hy-Tran Fluid.			
Manual steering	--	2-1/2 pt.	2-1/2 pt.	2-1/2 pt.	--	--	2-1/2 pt.	2-1/2 pt.	--	--				
Power steering	--	3-1/2 pt.	--	--	--	--	--	--	--	--				
Manual steering	1-1/2 pt.	--	--	--	2-1/2 pt.	2-1/2 pt.	--	--	3-1/2 pt.	3-1/2 pt.	IH Hy-Tran Fluid; or IH Torque Amplifier Transmission Lubricant Additive; or worm gear lubricant.			
Power steering	1-1/2 pt.	--	--	--	3-1/2 pt.	3-1/2 pt.	--	--	3-1/2 pt.	3-1/2 pt.				
Lubrication fittings	Use chassis lubricant (pressure gun grease), for all fittings on which the hand lubricator is applied, for all temperatures.													

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CRANKCASE BREATHER

The crankcase breather pipe is on the left side of the engine. If the breather pipe has a crimped aluminum element in it, the element must be cleaned after every 150 hours. To clean it, remove the breather pipe and remove the element from the pipe. Wash it in kerosene or other solvent and reinstall it.

If there is no element in the breather pipe, the element is inside the push rod cover in the breather baffle at the breather pipe opening. Replace the element with a new one at the time of a major overhaul.

OIL FILTER
(Full Flow System)

The life of your engine depends upon clean engine oil being circulated to all bearings. Every good tractor operator knows that dirt and other injurious materials eventually get into the crankcase of the engine and that in the normal course of engine operation the lubricating oil undergoes changes which produce sludge, acids, gums, varnish, and other harmful by-products.

The purpose of the oil filter is to separate and remove the dirt and other foreign substances from the oil to prevent these injurious materials from being circulated to the engine. Under normal operating conditions the service life of the filter is 200 hours. By following the simple, common sense procedure for keeping dirt and oil impurities away from precision-made engine parts, you will safe-guard your tractor engine against undue wear and the operating troubles and upkeep expense which are a natural result of that condition.

Note: To avoid delays, we recommend that you carry extra filter elements on hand so replacement can be made at the proper time.

CHANGING THE FILTER ELEMENT

Four Cylinder Diesel Engines

1. Do not change the element while the engine is running. Stop the engine; remove the crankcase oil pan drain plug and drain all oil from the crankcase while it is still warm.

2. Clean the filter case to prevent dirt from dropping into the base.

3. Remove the 1/8-inch square head pipe plug under the filter base and allow the oil filter to drain completely.

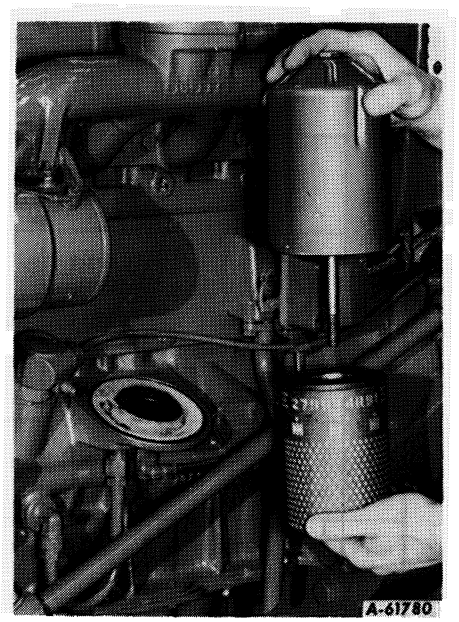
4. Unscrew the filter case bolt.

5. Lift up and remove the bolt and case, **Illusts. 4 and 5.**

6. Remove the old element.

Note: If any equipment on the tractor interferes with lifting the case over the element, remove the case and element together.

7. Wipe out the base, filter case, and by-pass valve assembly using a cloth dampened with a solvent. Then replace the filter base drain plug.



Illust. 4
Installing the new oil filter element.

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8. Connect the governor control rod and the fuel shut-off linkage.

9. Connect the return fuel line.

10. Open the fuel shut-off valve at the fuel tank. Purge the air from the fuel filters and fuel line to the inlet elbow. Use the hand pump if so equipped and connect the fuel line to the inlet elbow. Turn the engine over with the cranking motor and connect each fuel line to its injection nozzle as a full flow of fuel appears. See "Venting the Fuel System".

Note: All air must be eliminated from the fuel system before the engine will start and operate properly. All fittings and connections must be thoroughly tightened to prevent leakage of fuel and to prevent air from entering the fuel system.

VENTING THE FUEL SYSTEM

The system must be vented when —

— an engine, in operation, runs out of fuel.

— the fuel filters have been serviced or replaced.

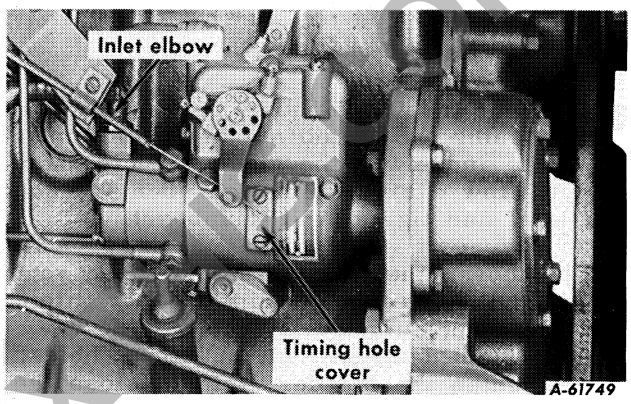
— any connections between the injection pump and the fuel tank have been loosened or broken for any reason.

— a new engine is being started for the first time.

If air has entered the diesel fuel system for any reason, vent the system according to the following procedure.

Four Cylinder Diesel Engines

1. Loosen the bleeder stem on the vent valve at the top of the fuel filter and allow the fuel to run out until it becomes a solid stream without air bubbles. Then tighten the bleeder stem to close the vent valve.



Illust. 19
Injection pump.
(Four cylinder diesel engines)

2. Loosen the hose coupling nut under the final fuel filter, then loosen the hose connection on the injection pump inlet elbow (**Illust. 19**) and allow the fuel to run out until it flows in a solid stream without air bubbles.

Tighten the hose connection at the inlet elbow and tighten the coupling nut under the final fuel filter.

3. Loosen the coupling nut on the fuel return line on top of the injection pump and allow the fuel to run out. Crank the engine by pressing the push button starting switch for a few seconds until the fuel runs out in a solid stream, without air bubbles. Then tighten the coupling nut.

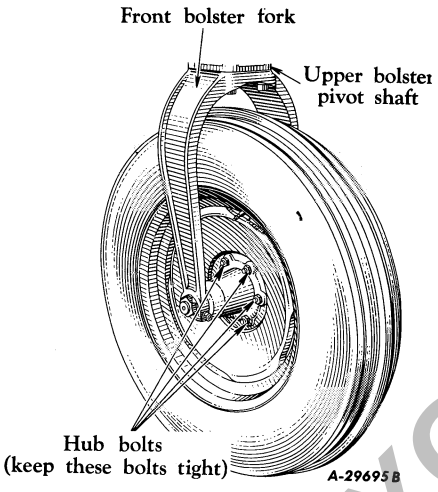
4. Try starting the engine. If the engine does not start use two wrenches (one for holding the adapter and the other for loosening the fuel pipe nut) and loosen the two center fuel pipe nuts at the injection nozzles. Crank the engine by pressing the push button starting switch until fuel appears. Be sure the adapters are tight; use two wrenches (one on the adapter and the other on the nut) and tighten the fuel pipe nuts. Start the engine.

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GREASING THE FRONT WHEELS

The Farmall and International 340 Diesel, 460 Diesel, and 560 Diesel Tractors are equipped with disc-type front wheels and pneumatic tires, **International 660 Diesel Tractors** are equipped with cast spoke front wheels with pneumatic tires. The wheels revolve on two tapered roller bearings and are protected by felt and leather seals. A dirt deflector is also provided on the axle to prevent dirt from entering at the inner bearing.

SINGLE FRONT WHEEL (Farmall 340 Diesel, 460 Diesel, and 560 Diesel Tractors)



Illust. 7
Single front wheel.

If the tractor has a single front wheel, check the hub bolts every month or after every 250 hours of operation to make sure that they are kept tightened at 100 minimum to 125 maximum foot-pounds torque.

SINGLE FRONT WHEEL

7.50-16 Pneumatic Tire Wheel

The 7.50-16 pneumatic tire wheel should be removed, cleaned and repacked with fibre grease every six months or after every 500 hours of operation. Follow the Removing and Greasing procedure for this operation.

9.00-10 Pneumatic Tire Wheel

The 9.00-10 pneumatic tire wheel should be lubricated daily or after every ten hours of operation.

Use pressure-gun grease (chassis lubricant) and apply two or three strokes of the lubricator, or a sufficient amount of grease to flush out the old grease and dirt. The lubrication fitting is located on the end of the front axle nut.

REMOVING AND GREASING

Be sure to keep all parts clean.

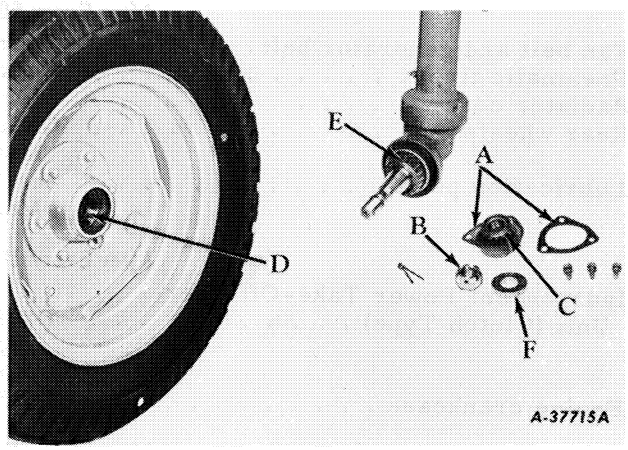
Every six months or after every 500 hours of operation, whichever occurs first, remove, clean and repack the front wheel bearings.

Raise the front end of the tractor until the wheels clear the ground. Remove hub cap and gasket "A", the cotter pin, nut "B" and washer "F". Remove bearing "C" and place it in hub cap "A" or in a clean container; then remove the wheel.

Clean the inside of hub "D", remove the old grease from the bearings, clean them with kerosene, and repack with fiber grease.

It is advisable to leave bearing "E" on the axle and clean it with a brush and kerosene. Repack the rollers with new grease before reassembling the bearings.

Inspect the oil seal felt washer and gasket and if they are not in satisfactory condition, replace them with new ones. A dirt deflector is also provided on the axle to prevent dirt from entering at the inner bearing.



Illust. 7A
Wheel removed for cleaning and greasing.

REPLACING AND ADJUSTING

Reassemble the wheel and tighten nut "B" until the wheel binds slightly, rotating the wheel at the same time. Back the nut off one castellation from the cotter pin hole; replace the cotter pin and hub cap.

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TROUBLE SHOOTING

Possible Cause	Possible Remedy
HARD TO START	
Fuel stop control button	Not completely in starting position.
Engine speed control lever not advanced	Advance the lever one-third for starting.
Flooded engine	Follow the starting instructions in the tractor Operator's Manual.
Defective glow plugs	Check and replace. See page 23.
Defective battery or cranking motor	Check and service; see pages 25 to 28, or replace.
Water in the cylinders	Check the cylinder head gasket or look for a clogged drain hole in the exhaust manifold or muffler.
Lack of compression	Check the cylinder head gasket.*
Lubricating oil of too high viscosity	Drain and refill with proper lubricant. See "Lubrication Table" on pages 2 and 3.
Gears engaged	Put the gearshift in the neutral position.
Flywheel ring gear teeth broken	*
Internal seizure	*
ENGINE OPERATES IRREGULARLY OR KNOCKS	
Engine incorrectly timed	Retime. See "Timing the Injection Pump", on page 21.
Injection pump out of time	Check the timing. See page 21.
Poor grade fuel or water in the fuel	Drain and use a good grade of clean fuel.
Injection nozzles dirty or stuck	Remove the defective nozzles, clean them and adjust.* Use clean fuel.
Air intake restricted	Service the air cleaner.
Air in fuel lines	Check connections - bleed fuel system.
Air leaks around the intake manifold	Check the gasket and tighten the nuts.
Engine valves at fault	Check the valve clearance.* See page 29.
Combustion knocks	Replace the nozzles or valves.
Engine overheating	Check the cooling system and fan belt; adjust the radiator shutter if used; see "Engine Overheats" on page 61.
Injection pump governor out of adjustment	*
Injection nozzles leaking	Replace.*
Excessive carbon in the engine	*
Loose piston pin or bearings	*
Broken rings or loose pistons	*
Worn connecting rod and main bearings	*
Engine smokes	Engine overloaded. Reduce the load. Check the fuel delivery and lubricant used. Check the injection pump governor adjustment. See smoke colors on page 62.*
LACK OF POWER	
Engine speed control lever not advanced	Advance the engine speed control lever.
Engine cold or overheated	Run the engine until it warms up before putting it under load. Adjust the radiator shutter if used. Check the cooling system.*
Engine overloaded	Reduce the load.
Air cleaner clogged	Clean.
Poor fuel	Use correct fuel; see the specifications.
Fuel pipes obstructed	Clean.
Fuel strainer obstructed	Clean; see page 14.
Fuel tank air vent closed	Open the vent in the cap.
Air in fuel lines	Check connections and vent fuel system. See pages 14, 15, 16, and 19.
Fuel filter partly clogged	Replace.
Exhaust pipe clogged	Clean out.
Injection nozzle valves dirty or stuck	Remove the defective valves, clean them or replace.* Use clean fuel.
Oil of too high viscosity in the crankcase or air cleaner	Drain and refill with proper lubricant. See "Lubrication Table" on pages 2 and 3.

*See your International Harvester dealer.

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