LUBRICATION

ENGINE OIL RECOMMENDATIONS

CAPACITY—4 QUARTS

SAE No. 30 for summer or temperatures above 90° F.
SAE No. 20 for spring and fall or temperatures between 90° F. and 32° F.
SAE No. 10-W for temperatures below 32° F.

CAUTION: If the engine is to be operated under constant heavy load over long periods in cold weather, do not use the light 10-W oil, but use the next heavier body oil.

Under a constant heavy load in warm weather, start using SAE 30 oil at a temperature of 65° F. instead of starting at 90° F.

Do not use heavier oils than are recommended above, nor oils that are poorly refined. Such oils cause gumming of valves and pistons and their use may result in loss of compression and possible mechanical damage, such as scored cylinders or burned out bearings.

GENERAL LUBRICATION

This tractor is equipped with pressure fittings wherever automatic lubrication cannot be provided. These fittings are few but important, so do not neglect to lubricate these points regularly. A good grade of semi-fluid pressure gun lubricant should be used in the grease gun in warm weather. In cold weather a lighter grade of lubricant is desirable, to insure that the lubricant will reach the bearing surfaces. Wipe the pressure fittings clean before using the grease gun.

FIRST GROUP—*Attention every 10 hours of operation.*

Steering Column	2 Strokes of Gun
Drag Link	2 Strokes of Gun
Steering Housing	2 Strokes of Gun
Spring Shackles	2 Strokes of Gun
Clutch Pedal	2 Strokes of Gun
Brake Pedal	2 Strokes of Gun
King Pins	2 Strokes of Gun
Front Axle Pivot Pin	2 Strokes of Gun
Tie Rod Ends	2 Strokes of Gun
Radius Rod Pivot	2 Strokes of Gun

The oil filler and breather cap on the engine valve cover should be cleaned by dipping it several times in a small amount of gasoline or solvent to remove any moisture or oil which may clog the filter. Dust and dirt accumulations around the breather pipe should be removed daily.

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SUGGESTIONS FOR CHECKING DIFFICULTIES

Listed herewith under their respective headings are some of the possible causes of engines not functioning properly. If you are having any difficulty with your engine, it may be well to check this list, to help you make the necessary adjustments to your engine so that it will function in a satisfactory manner.

ENGINE HARD TO START

Spark Plugs
Defective wires
Wires connected to wrong plugs
Defective magneto, distributor or coil
Gasoline flow obstructed
Vent in fuel tank cap clogged
Water in fuel supply
Improper gas mixture
Valves not seating properly
Valve tappets improperly adjusted
Intake manifold leaking
Improper timing.

ENGINE MISFIRES

Spark plug fouled
Wrong gap in spark plug
Cylinder head gasket leaking
Defective wiring
Manifold gasket leaking
Valves warped
Valves or tappets stuck
Valves improperly adjusted.

ENGINE OVERHEATING

Lack of water
Radiator clogged
Water hose clogged
Slipping fan belt
Leaky valves
Improper gas mixture
Carburetor choke valve partially closed
Spark retarded too far—timing late
Improper valve timing
Lack of oil
Using too heavy an oil
Engine too closely housed not permitting sufficient air
Oil diluted.

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PREPARING A NEW TRACTOR FOR USE

IMPORTANT: Your tractor has been put in operating condition by the dealer from whom purchased. Regardless, it is well to check the entire tractor to insure that everything is in order.

STARTING THE ENGINE

Before attempting to start the engine see that the crankcase, torque tube, air cleaner and transmission are filled with oil to the proper level. See that radiator is filled with clean water or with anti-freeze during cold weather.

Set the throttle lever about mid-position.

Tractors with magneto ignition: the ignition switch on tractors equipped with magneto is pushed in for starting, and pulled out for the off position.

Tractors with distributor ignition: the ignition switch is pulled out for starting, and pushed in for the off position.

Do not choke the engine too much or the carburetor will "flood."

Place the gear shift-lever in the neutral position.

Disengage the clutch.

Press in on the starter button.

In the event engine is to be hand cranked, handle of crank should be pulled upward with one-quarter turns, so the operator's hand will be out of the way should the engine backfire.

Immediately after starting engine, check oil pressure gauge to see that it is registering pressure.

RUNNING A NEW ENGINE

A new tractor should never be loaded to full capacity until it has been run light for a reasonable length of time. For the first 50 hours it should be run at half load or less before it is put on full load. (Do not confuse half load with half speed.)

When warming up an engine, especially during cold weather, do not race the engine. The oil is sluggish and flows slowly. Therefore, such practice is harmful to precision-made working parts. Throttle the engine to idling speed to permit a gradual warm up.

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SERIAL NUMBER

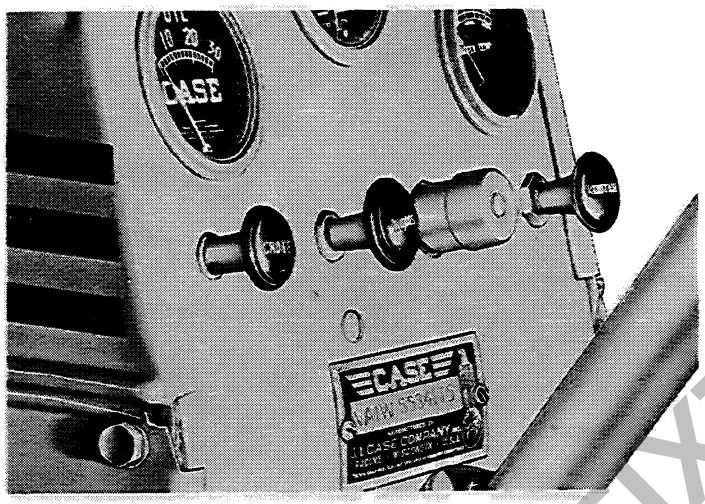


Figure 5. Instrument Panel and Serial Number

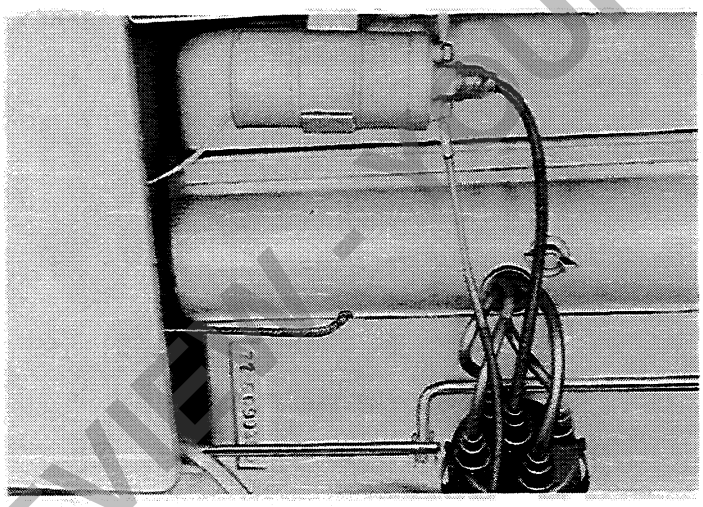


Figure 6. Engine Serial Number

When ordering parts, always give the tractor serial number. This is found on the name plate on the instrument panel.

If the parts to be ordered are engine parts, give the serial number of the engine, which is stamped in the right-hand side of the block.

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The following instructions are shown on side of air cleaner:

SERVICE DAILY

Empty cup of oil and sediment daily or more often in severe dust conditions. Wash out cup thoroughly. Replace removable parts and refill cup to oil level mark with light grade oil. Keep oil thin. Maintain connections between air cleaner and carburetor air tight.

Do not use an oil heavier than SAE 10W. Heavier oil will restrict the air flow.

All air cleaner connections must be air tight, or the purpose of the cleaner is defeated. Periodically, the inside surface of all hoses, the air intake pipe, and the pipe cap should be thoroughly cleaned.

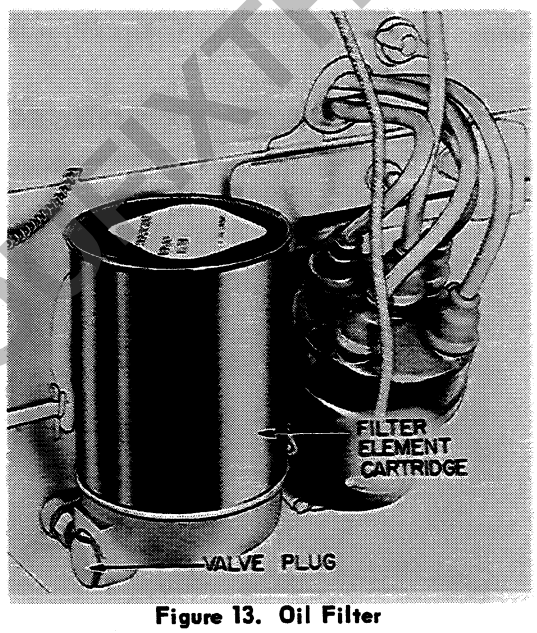


Figure 13. Oil Filter

OIL FILTER

A flange-mounted type oil filter with a replaceable cartridge is furnished as standard equipment. The purpose of the filter is to remove all foreign matter from the engine oil and prevent such material from being circulated through the engine. It is important therefore, that the filtering element be replaced when it no longer serves its purpose. Ordinarily this is the case every time the crankcase oil is changed, which is approximately every 120 hours of operation.

To remove the element, simply grasp the cylindrical unit, and turn counter-clockwise, and lift straight up to avoid damaging the inlet tube.

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SERVICING MAGNETO

This should include only service operations involving the timing of the engine or replacement of the entire magneto unit.

In normal use, the magneto will seldom require timing unless it has been removed from the engine for servicing. The magneto has been properly timed and adjusted at the factory and the position of the crankshaft in relation to the occurrence of the spark plug does not change appreciably in use.

NOTE: No Warranty Service Work will be approved should it be done on a Case Magneto by anyone other than an authorized Case Magneto Service Station or Case Magneto Depot Station which have all of the necessary tools and equipment to do this work in a satisfactory manner and are familiar with handling Magneto Warranty Service.

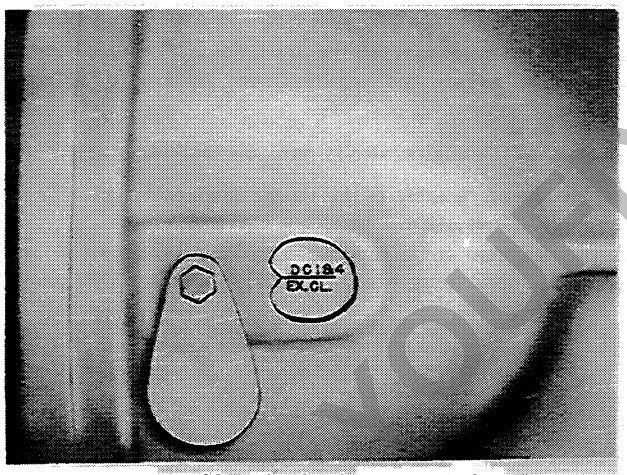


Figure 20. Flywheel Timing Marks

CHECKING TIMING OF MAGNETO

In checking the timing, turn the engine over slowly with the hand crank until the impulse coupling releases. At this point the marking on the flywheel $\frac{\text{DC 1 \& 4}}{\text{EX. CL.}}$ should be 3/16" below the pointer in the timing hole located on the left side of the flywheel housing.

If the impulse coupling releases at some other point, it will be necessary to loosen the two cap screws in the mounted flange of the magneto, and rotate the magneto slightly until the impulse releases at the desired point. Moving the top of the magneto toward the engine retards the spark; moving it away from the engine advances the spark.

CAUTION: Never advance the spark from that established above, especially if the tractor is to be hand cranked. There is danger of kick-back due to the spark occurring ahead of the top dead center position of the crankshaft if the spark is too far advanced.

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VALVE COVER AND GASKET

The valve cover on the engine head seals dust and dirt from the valve rocker arm mechanism.

When the valve cover is removed, clean thoroughly before replacing on the engine. Use a new valve cover gasket to make sure the cover will be fully sealed, and oil leaks will be prevented.

VALVES AND ROCKER ARMS

Some engine difficulties can be traced to the operation and adjustment of the valves. Hard starting, engine missing, engine overheating, lack of power, and explosions in the exhaust pipe are a few of these difficulties.

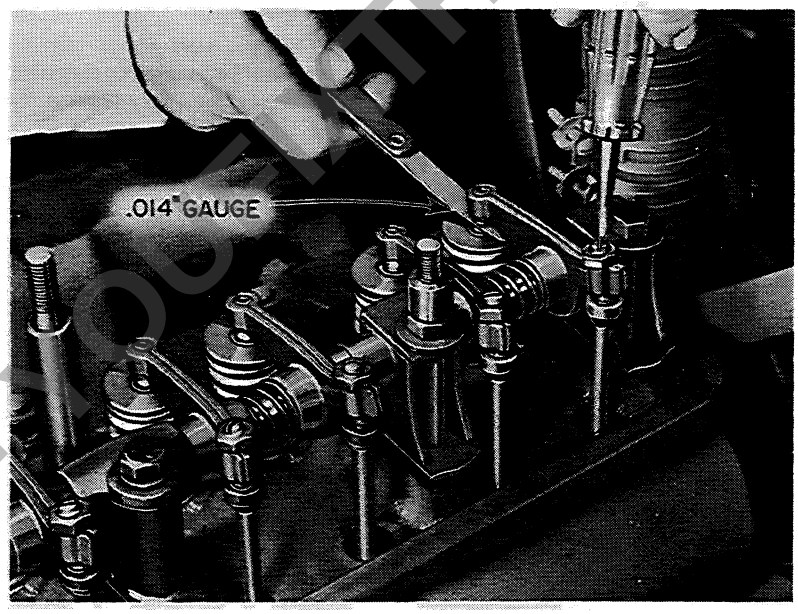


Figure 28. Setting Valve Clearance

ADJUSTING VALVE CLEARANCE

The clearance between the rocker arms and the end of the valve stem should be checked occasionally and adjustments made if necessary. The proper clearance should be .014 inch for both the intake and the exhaust valves when the engine is cold and with the valve completely closed.

To make adjustments, loosen the lock nut on the rocker arm and turn the adjusting screw until the proper clearance is obtained. A .014-inch feeler gage should slip snugly between the rocker arm and valve stem. Tighten the lock nut and recheck clearance.

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