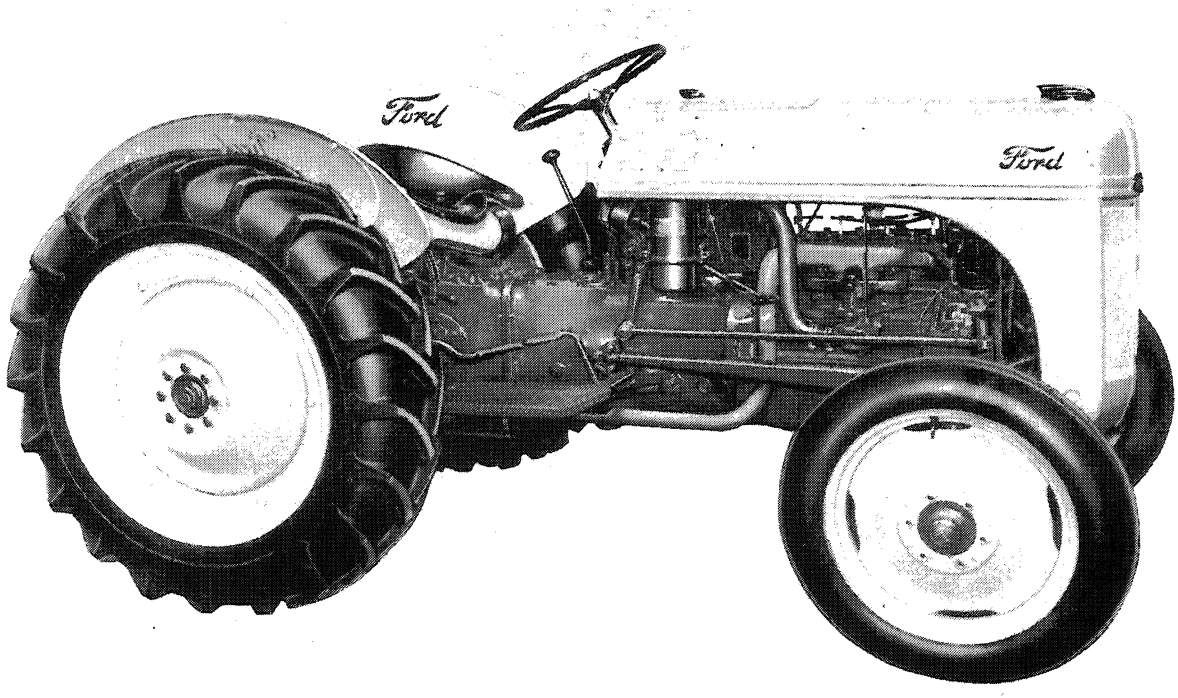
FORD

Service Manual

FORD
NEW HOLLAND

Tractors
9N, 2N and 8N



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NOTE: This service manual has been compiled from several out-of-print Ford Motor Company Publications. Although the primary subject of this manual is the 8N tractor, most of the information which follows is also useful for 9N and 2N tractors.

CONTENTS

DESCRIPTION AND SPECIFICATIONS

Section

111. DESCRIPTION.

The Model 8N Ford tractor is provided with a steering gear assembly of the automotive ball nut type. It is a highly efficient, easily serviced unit which is readily adjustable to compensate for wear. This steering gear has a low driver fatigue factor because of easy steering and a minimum of road shock.

The tractor is equipped with a four forward and one reverse gear transmission. The transmission contains constant-mesh helical gears, assuring quiet running and providing for long life.

The power take-off is driven from the transmission countershaft. A power take-off adapter is available to extend the shaft when such extension is necessary for fitting certain implements. The adapter meets the American Society of Agricultural Engineers' specifications for a standard tractor hitch. Any implement built to these standards may be hitched to the Ford tractor without the purchase of additional accessories.

The tractor hydraulic system consists of a piston pump driven directly by the power take-off shaft, and a self-contained hydraulic unit which includes the ram cylinder and control linkage. The hydraulic pump and unit are located in the center housing and employ the transmission oil as the hydraulic fluid. This design reduces the possibility of external oil leakage, and greatly reduces repair costs.

The belt pulley assembly is self-contained, and is driven by the power take-off shaft. The pulley assembly is easily mounted on the tractor and has a separate oil supply.

The differential assembly is of the heavy duty truck type, and is driven by the transmission main shaft. The differential furnishes the power directly to the semi-floating rear axles.

112. SPECIFICATIONS.

The following specifications are given as an aid to the mechanic in repairing the Model 8N Ford tractor.

a. General.

Type . . . . . 4-wheel, general purpose

Wheelbase . . . . . 70 in. at 48 in. tread width
Over-all length, front to drawbar . . . . . 115 in.
Over-all height . . . . . 54½ in.
Over-all width, normal tread . . . . . 64¾ in.
Tire size:
  Front . . . . . 4.00 x 19—4 ply
  Rear . . . . . 10.00 x 28—4 ply
Front tread . . . . . 48 to 76 inches in 4-inch steps
Rear tread . . . . . 48 to 76 inches in 4-inch steps
Ground clearance:
  Front axle . . . . . 21 in.
  Rear axle . . . . . 21 in.
  Center . . . . . 13 in.
Turning circle radius (with use of brakes):
  Made by outer front wheel . . . . . 8 ft.
  Made by centerline of tractor at rear axle . . . . . 3½ ft.
Shipping weight (including gasoline, oil, water, tires filled with air, operator not included) . . . . . 2,410 lbs.
Drawbar height . . . . . 8½ to 34¼ in., 18 in. standard setting

Gear Ratio	Final Gear Reduction	Speeds at 1500 R.P.M.	Speeds at 2000 R.P.M.
1 Low (first)	73.33 to 1	2.54 M.P.H.	3.40 M.P.H.
2 Plowing (second)	57.04 to 1	3.28 M.P.H.	4.37 M.P.H.
3 Cultivating (third)	41.45 to 1	4.51 M.P.H.	6.02 M.P.H.
4 High (Fourth)	19.86 to 1	9.40 M.P.H.	12.54 M.P.H.
5 Reverse	44.64 to 1	4.19 M.P.H.	5.58 M.P.H.

b. Capacities—U. S. Measure.

Fuel tank . . . . . 9 gals. standard
1 gal. reserve
10 gals. total
Engine oil pan (less filter absorption) . . . . . 6 qts.
Transmission, hydraulic lift, and differential . . . . . 5 gals.
Cooling system . . . . . 12 qts.
Oil bath air cleaner . . . . . Fill to indicated level
Belt pulley . . . . . 1 qt.

Tire pressure:
  10.00 x 28—4 ply . . . . . 12 lbs.
  4.00 x 19—4 ply . . . . . 26 lbs.

c. Engine.

Type	4-cylinder "L" head
Rated speeds	1500 and 2000 R.P.M.
Idle speed	400 R.P.M.
Cylinder bore	3.188 in.
Stroke	3.75 in.
Piston displacement	119.7 cu. in.
Torque	84 lbs. ft. at 1500 R.P.M.
Compression ratio	6.0 to 1
Sleeves	Dry type
Piston	Cast steel
Rings:	
Compression	2
Oil	1
Piston pin	Full floating
Rod bearings	Replaceable shell-type
Main bearings	Replaceable shell-type
Crankshaft	Cast steel, static and dynamic balanced
Compression pressure at cranking speed (sea level)	90 lbs. minimum

d. Ignition System.

Type	Battery
Distributor:	
Firing order	1-2-4-3
Drive	Directly by camshaft
Automatic spark advance	Centrifugal governor
Initial timing (degrees of crankshaft)	Top dead center
Maximum advance (degrees of crankshaft)	24°
Distributor breaker cam	4 lobe
Breaker contacts	1 set
Breaker contact spacing	0.015 in.
Spark plugs:	
Type	Marked H-10
Size	14 mm
Gap	0.025 to 0.028 in.

e. Carburetor.

Type	Single up-draft
Idle fuel adjustment	1 screw
Main fuel jet	1 screw
Idle speed	1 screw

f. Governor.

Type . . . . . Variable speed, mechanically operated, centrifugal type
Governed speed range . . . . . 800 to 2200 R.P.M.
Maximum governed speed adjustment . . . . . 1 screw

g. Cooling System.

Radiator cap (pressure type):—
  Pressure valve opens at . . . . . 3¼ to 4¼ lbs. per sq. in.
  Vacuum valve opens at . . . . . ½ to 1 lb. per sq. in.
Water Pump:
  Type . . . . . Centrifugal
  Drive . . . . . V-belt
Fan:
  Type . . . . . 6-blade pull
  Drive . . . . . V-belt
Thermostat:
  Location . . . . . Cylinder head outlet hose
  Starts to open . . . . . 160-165° F.
  Fully open . . . . . 190-200° F.

h. Electrical System.

Generator:
  Type 3-brush
  Drive . . . . . V-belt
  Rating:
    1500 Engine R.P.M. . . . . 10 amps
    Maximum output . . . . . 11 amps
  Capacity . . . . . 119 watts
Generator regulator:
  Cutout closing voltage . . . . . 6.0 to 6.3 volts
  Voltage regulation . . . . . 7.0 to 7.3 volts
Battery:
  Type 6-volt
  Drive . . . . . Automatic engagement

i. Transmission.

Type . . . . . Constant mesh
Release bearing (pre-lubricated) . . . . . Ball bearing
Pedal free travel . . . . . ¾ in.

j. Rear Axle.

Type . . . . . Semi-floating
Ratio . . . . . 6.66 to 1

k. Brakes.

Type ..... Internal expanding
Control ..... Individual, mechanical
Adjustment at each wheel ..... 1 screw
Brake pedal free play ..... ¾ in.
Thickness of lining ..... 0.187 in.
Width of lining ..... 2.000 in.
Length of lining ..... 12.910 in.
Total brake lining area (two wheels) ..... 103.3 sq. in.

l. Steering Gear.

Type ..... Automotive ball nut
Ratio, turns of steering wheel for total travel of
pitman arms, at 48 in. wheel tread 2.25
Steering wheel diameter ..... 18 in.

m. Hydraulic System.

Type ..... Internal
Maximum pressure ..... 1500-1700 lbs. per sq. in.
Pump:
Type ..... Scotch yoke piston
Drive ..... Direct power take-off shaft
Capacity:
2000 engine R.P.M. ..... 2.85 gals. per min.
1500 engine R.P.M. ..... 2.15 gals. per min.
Control ..... Manual and automatic
Oil supply ..... Transmission and differential

n. Power Take-off Adapter.

Spline 1⅜
Speed (1500 Engine R.P.M.) ..... 545 R.P.M.

o. Belt Pulley.

Pulley speed (2000 engine R.P.M.) ..... 1358 R.P.M.
Belt speed (2000 engine R.P.M.) ..... 3199 ft. per min.
Pulley size (standard) ..... 9 in.

Chapter

1

DESCRIPTION AND DISASSEMBLY

The Ford 4-cylinder engine (figs. 1 and 2) is of the L-head type, having all cylinders and the upper half of the crankcase cast in one piece. Steel cylinder sleeves are used, which are easily replaced when rebuilding the engine. The distributor is driven directly from the front end of the camshaft.

111. DATA

Type	L-head
Taxable horsepower	16.2
Number of cylinders	4
Bore	3.187 in.
Piston displacement	119.5 cu. in.
Torque	85 lbs. ft. at 1200 RPM
Firing order	1-2-4-3

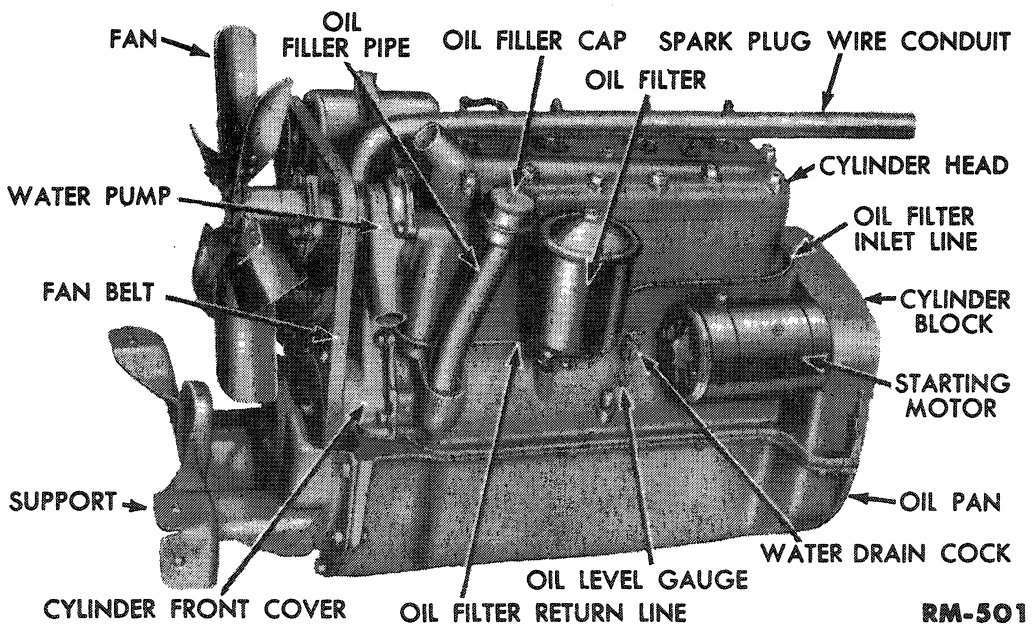

Fig. 1—Left ¾ Front View of Engine

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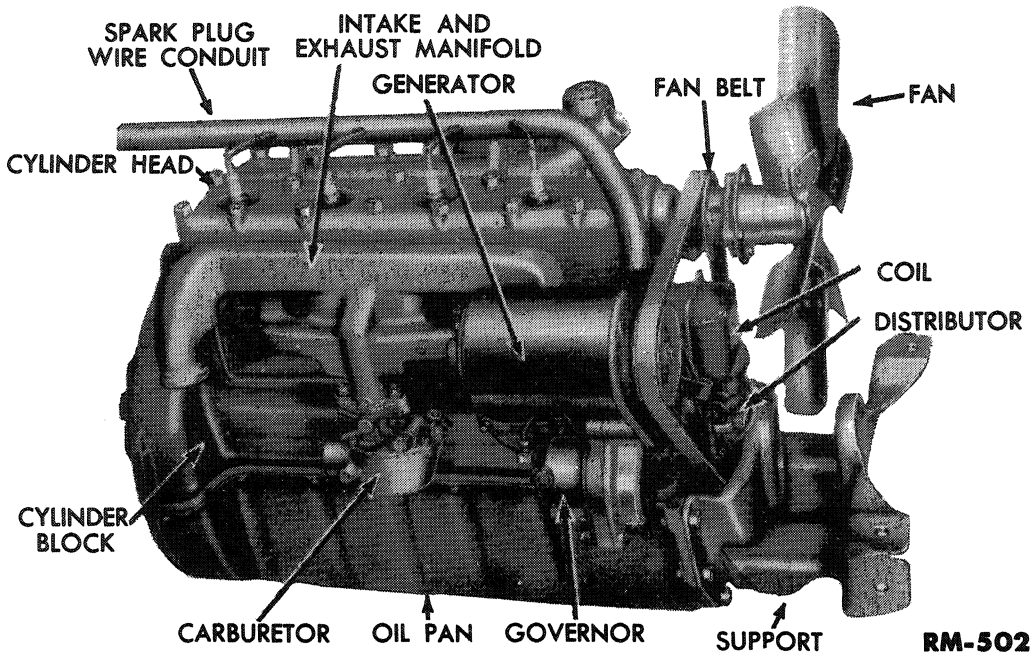

Fig. 2—Right ¾ Front View of Engine

Valve stem clearance to push rods:

Intake	0.010 to 0.012 in.
Exhaust	0.014 to 0.016 in.
Valve lifters	Non-adjustable

112. ACCESSORY REMOVAL.

In the disassembly procedures throughout this manual, disassembly is carried out only to the extent necessary for complete inspection of the parts subject to wear. The replacement or repair of the individual parts thus inspected is referred to as repair.

a. Remove Generator. Remove the nuts that secure the generator adjustment bracket to the timing gear side cover and generator. Disconnect the generator wiring. Remove the bolt and washer that secure the generator to the cylinder front cover, and remove the generator (fig. 2).

b. Remove Oil Filter. Disconnect the oil inlet line at the cylinder block. Disconnect the oil return line from the governor. Remove the two cap screws that secure the oil filter bracket to the cylinder head. Remove the oil filter and lines (fig. 1).

c. Remove Distributor and Spark Plug Wires. Remove the two nuts that secure the spark plug wire conduit to the cylinder head. Remove the two cap screws and lock washers that secure the

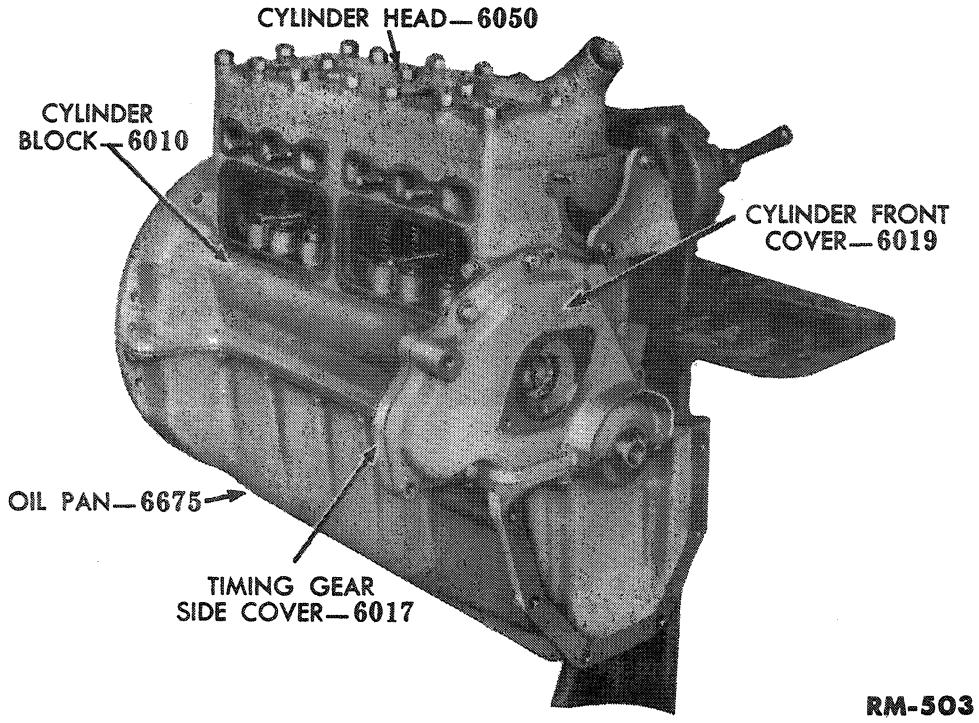

Fig. 3—Stripped Engine

distributor to the cylinder front cover. Remove the distributor and wires.

d. Remove Carburetor. Remove the two nuts and lock washers that secure the carburetor to the intake manifold. Remove the carburetor (fig. 2).

e. Remove Starting Motor. Loosen the two starting motor cap screws until the starting motor is free of the clutch housing. Lift the starting motor from the engine (fig. 1).

113. ENGINE DISASSEMBLY.

This section contains instructions for the complete disassembly of the stripped engine.

a. Remove Intake and Exhaust Manifolds. Remove the nuts and washers that secure the intake and exhaust manifolds to the cylinder block. Lift the manifolds off the cylinder block as an assembly (fig. 2).

b. Remove Water Pump. Remove the cap screw and nuts which secure the water pump to the cylinder block. Lift the water pump from the cylinder block.

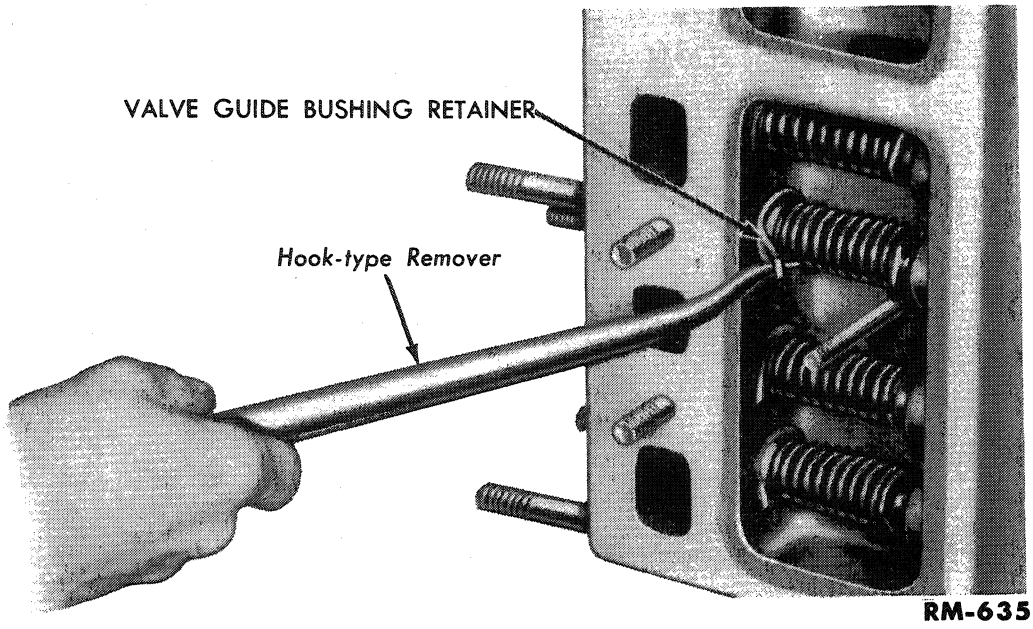

Fig. 4—Removing Valve Guide Bushing Retainer

c. Remove Clutch Disk. Press in on the clutch release levers, and install three wood wedges between the clutch release levers and pressure plate cover (fig. 48). Remove the six pressure plate cap screws, pressure plate, and clutch disk.

d. Remove Flywheel. Remove the lock wire from the four flywheel cap screws. Remove the four flywheel cap screws and dowel retainer. Tap the flywheel off the dowel pins with a rawhide hammer. Lift the flywheel out of the clutch housing.

e. Remove Cylinder Head. Remove all the nuts that hold the head to the cylinder block. Remove the cylinder head and gasket (fig. 3).

f. Remove Valve Assemblies and Camshaft. Remove the cylinder front cover (fig. 3) from the cylinder block. Remove the nut and flat washer from each valve chamber cover. Remove the valve guide bushing retainer with a hook-type remover (fig. 4) from all valves that are in the closed position. Turn the crankshaft until those valves which were in an open position are closed. Repeat the above procedure, and remove the remaining valve guide bushing retainers. Remove the valve assemblies from the cylinder block with

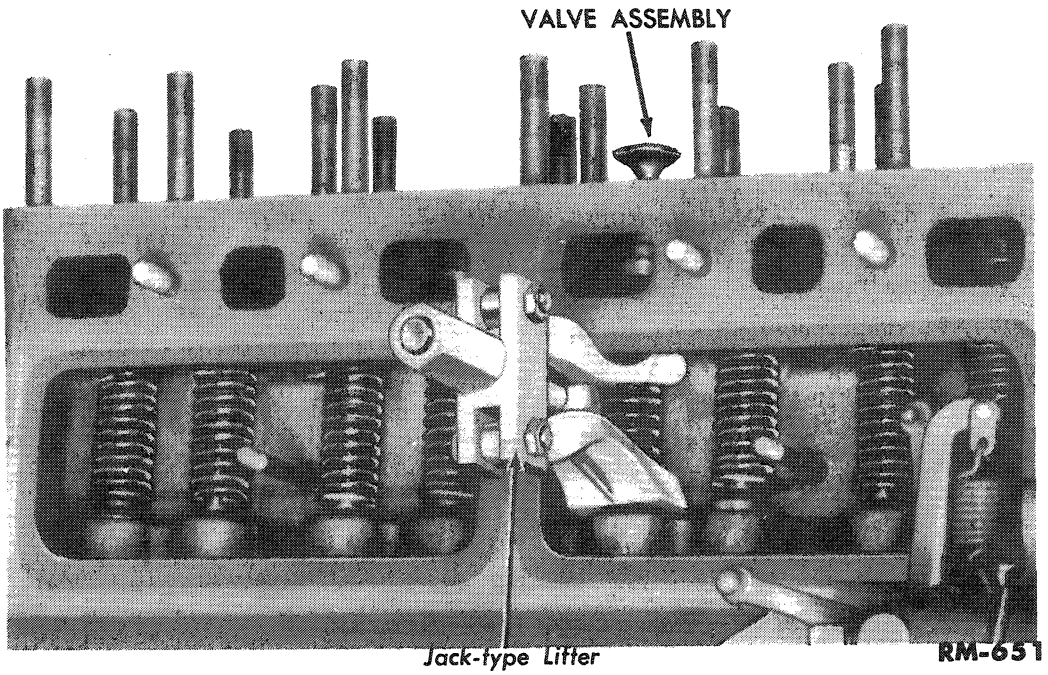

Fig. 5—Removing Valve Assembly

a jack-type lifter (fig. 5). As the valves are removed, tag or otherwise identify them as to the cylinders from which they were removed. Lift the push rods from the cylinder block. Slide the camshaft out of the cylinder block, being careful not to injure the camshaft bearing surface with the sharp corners of the cams.

g. Remove Oil Pump and Oil Pump Screen Cover Assembly. Remove the cap screws that secure the oil pan to the cylinder block, and remove the oil pan. Remove the lock wires and cap screws that secure the oil pump screen cover assembly to the oil pump (fig. 6). Remove the oil pump screen cover assembly from the engine.

h. Remove Connecting Rod and Piston Assemblies. Remove the two nuts from No. 1 connecting rod. Lift the connecting rod bearing cap from the connecting rod. Tap the connecting rod and piston out of the cylinder block with the handle end of a hammer (fig. 7). Install the connecting rod bearing cap on the connecting rod to prevent the bearing inserts from becoming mixed. Repeat the above procedure to remove the remaining connecting rod and piston assemblies.

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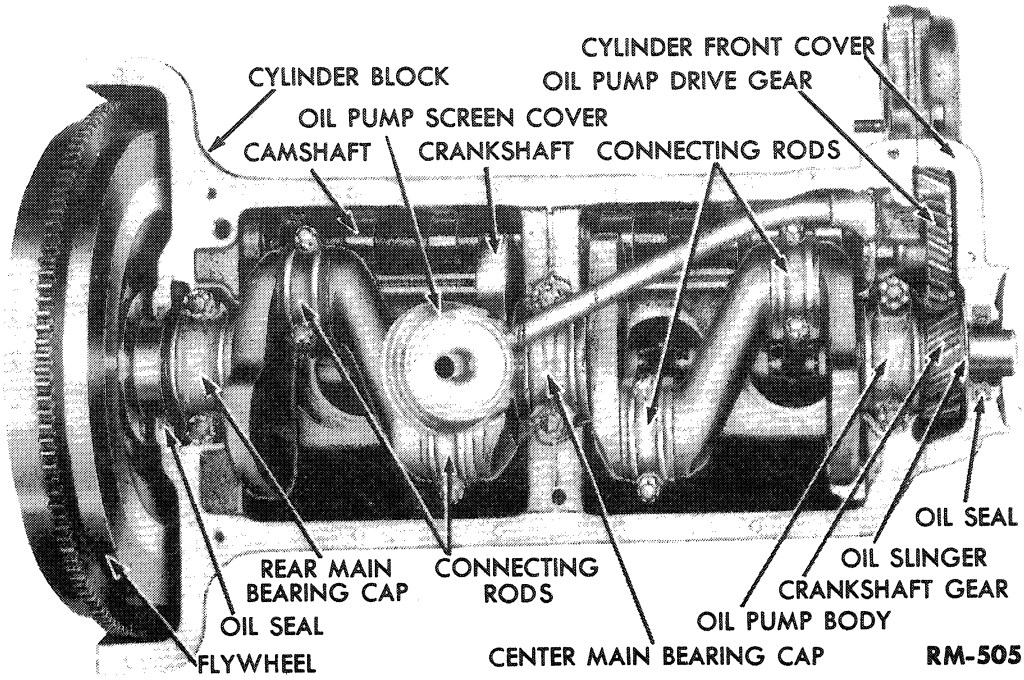

Fig. 6—Underside of Engine with Oil Pan Removed

i. Remove Crankshaft. Remove the lock wire and castellated nuts or self-locking nuts from the main bearing caps (fig. 7), and remove the bearing caps. Lift the crankshaft from the cylinder block.

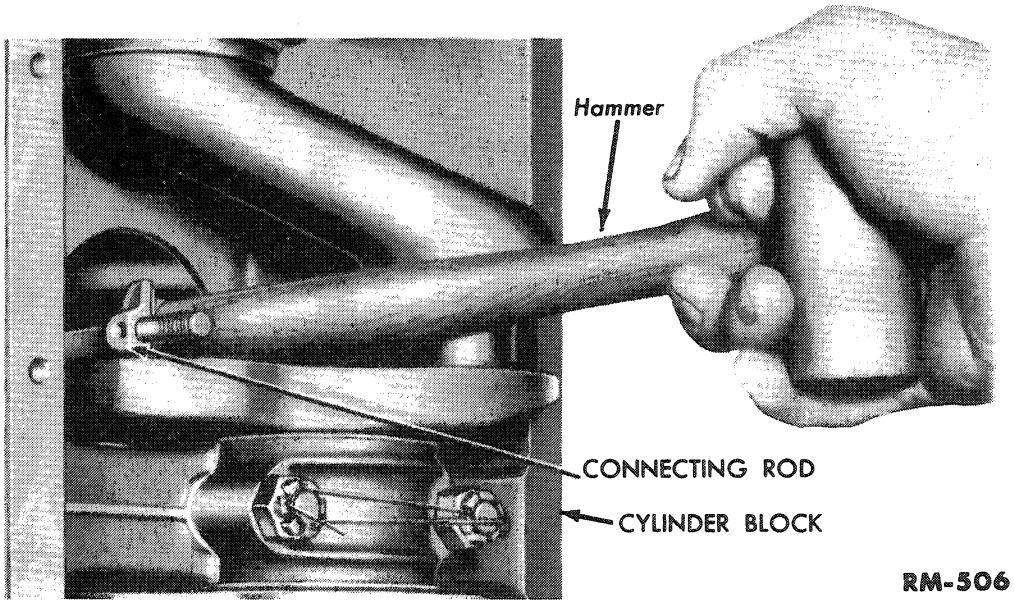

Fig. 7—Removing Connecting Rod and Piston Assembly