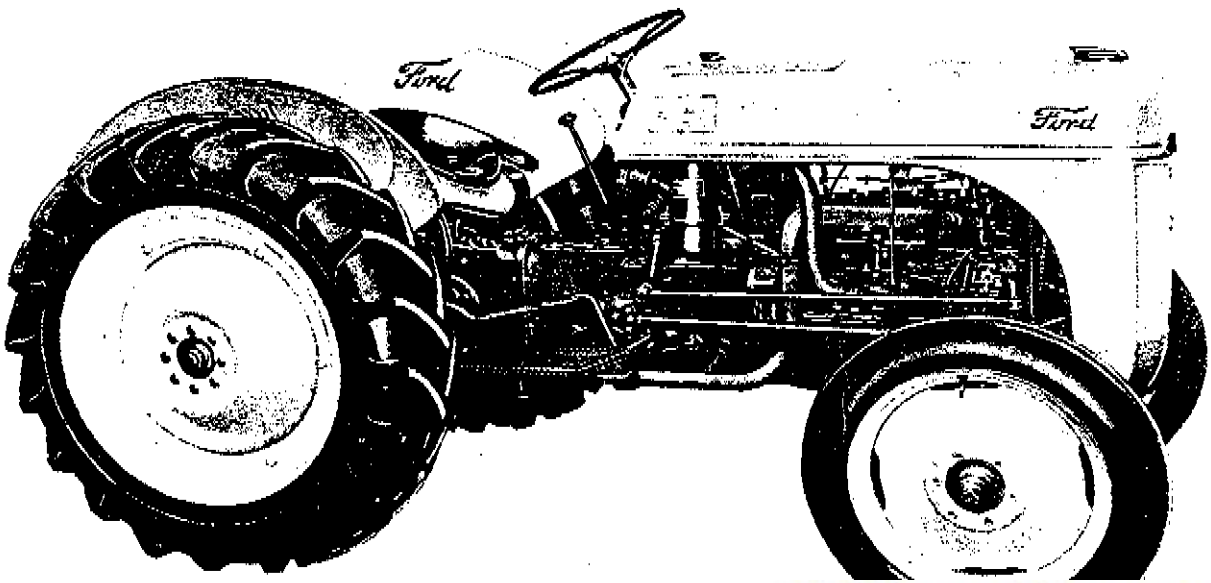
FORD

Service Manual

FORD
NEW HOLLAND

Tractors
9N, 2N and 8N



FORD - 9N-2N-8N

The Ford 9N had its beginnings with a hand shake agreement between Henry Ford and Harry Ferguson.

Harry Ferguson, an Englishman, had worked with a system of implement attachment and hydraulic controls. The design work had been conducted for almost 20 years and resulted in the 3-point linkage or hitch.

It soon became apparent that a new tractor would be necessary to incorporate the Ferguson system.

Henry Ford met with Harry Ferguson and a gentlemen's agreement reached, whereby Ford would use the Ferguson system in the manufacture of the new tractor.

Ford Motor Company had the resources of capital and factories to undertake volume production of a Ford-Ferguson system tractor. Harry Ferguson began to form a company to market the tractors and the implements designed to fit the 3-point hitch.

This agreement, according to records, was not witnessed or recorded as to the terms and conditions. A few years later this was to be a legal problem that would require lawyers and experts to untangle and settle.

The new tractor was the 9N. It was known as a Ford tractor with Ferguson system. The tractor was demonstrated at the Ford farm at Dearborn, Mi. in June, 1939. The tractor had the Ford Logo, Ferguson system plate, and was painted grey. This was Harry Ferguson's favorite color.

The 9N was quite readily accepted and became popular among farmers. It marked the re-entry of Ford in the small tractor market and the new Ferguson system was one of the biggest advances in tractor development. The first year more than 10,000 units were sold.

Ford was selling the 9N at a very competitive price and manufacturers remembered how Ford had out-priced the competition with the Fordson in earlier years.

The 9N was manufactured until 1942. The war placed restrictions on raw materials and production almost stopped in 1942. Ford then brought out the 2N with some modifications, primarily to use parts more available during the war years.

Ford had now moved to second place in tractor production, led only by International Harvester.

By 1948 Ford had announced the new tractor to be called the Ford 8N with the Ferguson system Hydraulics. This led to a legal suit by Harry Ferguson.

After a costly court battle, Ferguson won the case and a settlement was made by Ford Motor Company. Ferguson manufactured the Ferguson tractor for a few years, and then merged with Massy-Harris to become Massey-Ferguson.

The 8N tractor proved popular and Ford remained the second largest tractor manufacturer with the 8N and the specially designed mounted implements for it.

The 8N, when tested in 1950, produced the following results: the tractor weighed 2,717 lbs., equipped with 10 x 28 rear and 4.00 x 19 front tires. It featured Ford's own four cylinder L head engine with 3-3/16 inch by 3-3/4 inch bore and stroke, rated at 1750 RPM. It had a four speed transmission ranging from 3.2 MPH to 11.9 MPH. The horsepower rating on the drawbar was 17.6 and 23.2 HP on the belt.

Ford was not only selling a popular tractor, but a different way of farming which the farmers were anxious to adopt. By 1949 the sales of small tractors were beginning to decline, and larger tractors were in demand.

The Ford 8N kept the company as the second largest manu

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DESCRIPTION AND SPECIFICATIONS

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 . . . . .

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 . . . . .
4.00 x 19—4 ply . . . . .

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	
Idle speed	

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.....
Ratio.....

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

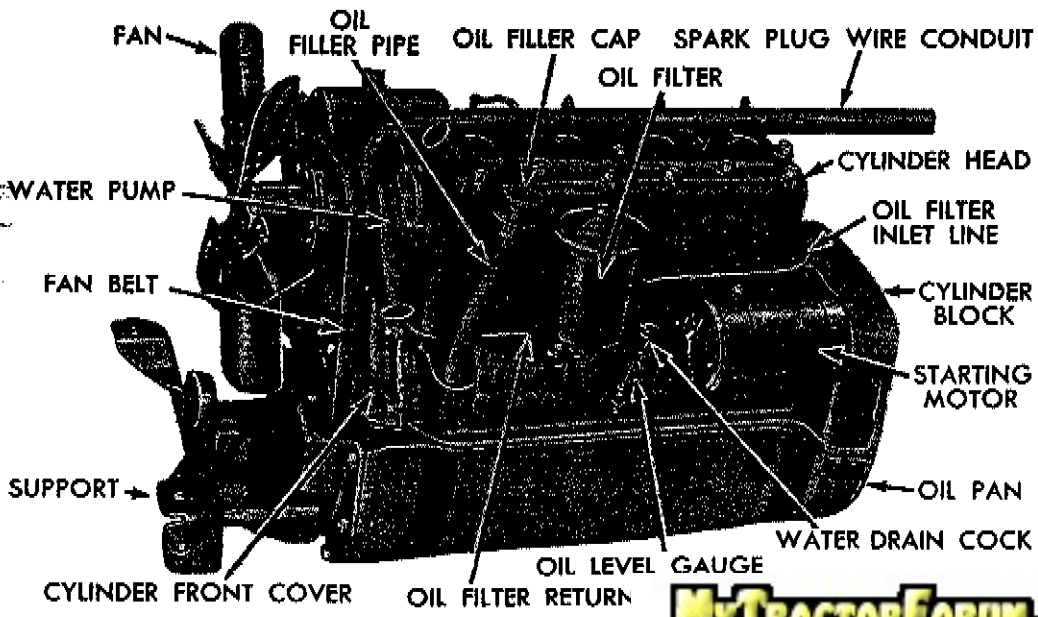

Fig. 1—Left ¾ Front View

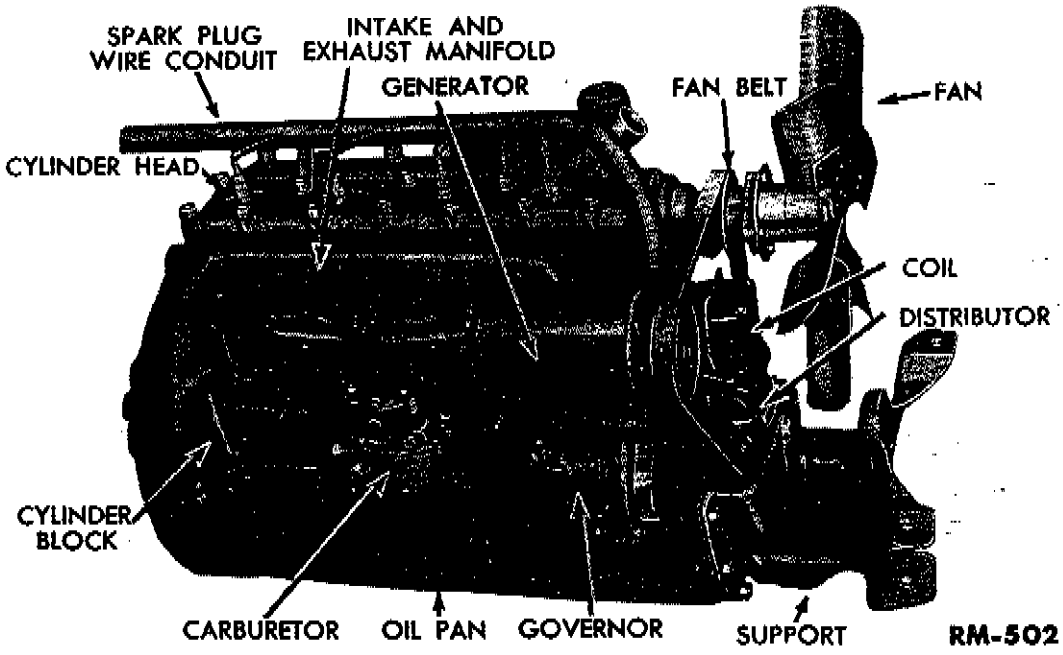

Fig. 2—Right ¾ Front View of Engine

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 [illegible] two nuts that secure the spark plug wire cond[illegible] head. Remove the two cap screws and lock was[illegible]