

# FORD

## Service Manual



### Tractors

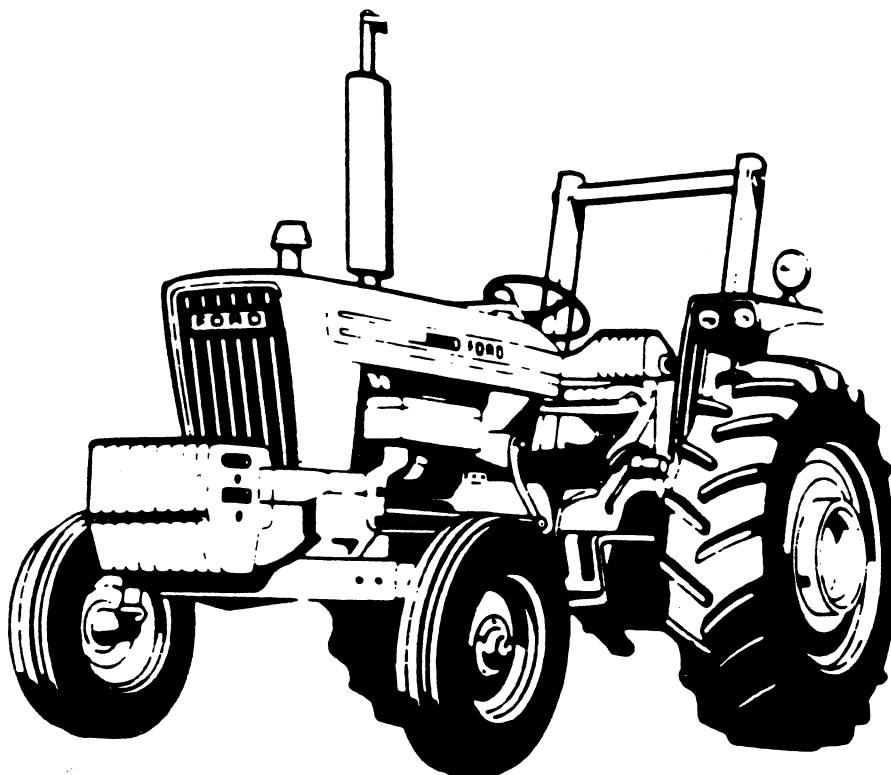
2600, 3600, 4100, 4600, 5600, 6600,  
6700, 7600, 7700

Part 1 – Engine Systems

Part 2 – Fuel Systems

Part 3 – Electrical Systems

Vol. 1



# FOREWORD

This Repair Manual provides information for the correct servicing and overhaul of the Ford 3 and 4-cylinder agricultural tractors and derivative models and is an essential publication for all service personnel carrying out repairs or maintenance. We would therefore recommend that this Manual is available for reference at all times.

The Manual is divided into thirteen PARTS each sub-divided in turn into Chapters. Each Chapter contains information on general operating principles, detailed inspection and overhaul and, where applicable, specifics on trouble shooting, special tools and specifications. Any reference in this Manual to tractors with cabs or platforms only applies to the Ford Tractor Safety Cabs and Ford Flat Deck Platforms. For Ford Tractors with non-Ford cabs or platforms the Less Cab overhaul procedures should be used. Any reference to right, left, rear, front, top or bottom is as viewed from the operator's seat.

The material contained in this Manual was correct at the time of going to print but Ford policy is one of continuous improvement and the right to change prices, specifications, equipment or design at anytime without notice is reserved. All data in this Manual is subject to production variations and the illustrations do not necessarily depict the tractors to standard build specifications.

TRACTOR OPERATIONS  
FORD MOTOR COMPANY

# **PART 1**

## **ENGINE SYSTEMS**

# PART 1

## ENGINE SYSTEMS

### Chapter 1

### DIESEL ENGINES

Section	Page
A. DIESEL ENGINE—DESCRIPTION AND OPERATION	1
B. DIESEL ENGINE—OVERHAUL	4

#### A. DIESEL ENGINE—DESCRIPTION AND OPERATION

This Chapter describes the overhaul and repair of the Ford Tractor direct injection diesel engines. The Chapter covers the 3 and 4-cylinder engines, the latter in both the normally aspirated and turbocharged forms, Figures 1, 2, 3 and 4.

The engines feature cross flow cylinder heads with the inlet and exhaust manifolds on opposite sides of the head. The combustion chamber is formed in the crown of the piston which has three compression and one oil control ring, all located above the piston pin.

All the engines are of similar design and hence service procedures are basically common throughout the range. The major difference between the engines is that the 4-cylinder units are fitted with a dynamic engine balancer and the Ford 7600 and 7700 engines are turbocharged.

The cylinder head assembly incorporates the valves, valve springs and spring retainers. Valve guides are an integral part of the cylinder head with replaceable valve seats pressed into the valve ports.

The following chart shows the 3 and 4-cylinder diesel engine options available.

Model	Ford 2600	Ford 3600	Ford 4100	Ford 4600	Ford 5600	Ford 6600 & 6700	Ford 7600 & 7700 (Turbo-charged)
No. of Cylinders	3	3	3	3	4	4	4
Bore	4.2 in. (106.7 mm)	4.2 in. (106.7 mm)	4.2 in. (106.7 mm)	4.4 in. (111.8 mm)	4.2 in. (106.7 mm)	4.4 in. (111.8 mm)	4.4 in. (111.8 mm)
Stroke	3.8 in. (96.5 mm)	4.2 in. (106.7 mm)	4.4 in. (111.8 mm)	4.4 in. (111.8 mm)	4.2 in. (106.7 mm)	4.2 in. (106.7 mm)	4.2 in. (106.7 mm)
Displacement	158 in <sup>3</sup> (2588 cm <sup>3</sup> )	175 in <sup>3</sup> (2861 cm <sup>3</sup> )	183 in <sup>3</sup> (2977 cm <sup>3</sup> )	201 in <sup>3</sup> (3289 cm <sup>3</sup> )	233 in <sup>3</sup> (3814 cm <sup>3</sup> )	256 in <sup>3</sup> (4186 cm <sup>3</sup> )	256 in <sup>3</sup> (4186 cm <sup>3</sup> )

A crankshaft driven dynamic balancer, installed on the 4-cylinder engines, counteracts out-of-balance forces and thereby reduces engine vibration. The balancer housing is bolted to the bottom of the cylinder block and contains two meshing gears which are driven and timed from a gear machined on the crankshaft.

The piston connecting rods are of 'I' section and for the turbocharged engines a centrally drilled hole facilitates both pressure lubrication of the piston pin bushing and cooling of the piston crown.

The fully floating piston pin is retained in the piston by two snap rings.

## **LUBRICATION SYSTEM**

Lubrication of the engine is maintained by a rotor type oil pump mounted at the base of the engine block. The oil pump is driven from the camshaft and draws oil from the engine sump through a wire mesh screen.

A spring loaded relief valve in the pump body limits the pressure in the system by directing excess oil back to the intake side of the pump.

Oil passes from the pump to an external, replaceable, canister type filter incorporating a relief valve which permits oil to be bypassed, if filter blockage occurs, and ensure engine lubrication at all times.

Oil flows from the filter to the main oil gallery which runs the length of the cylinder block and intersects the camshaft follower chambers.

The main gallery also supplies oil to the crankshaft main bearings and to the connecting rod journals via drillings in the crankshaft. Drilled passages from each main bearing direct oil to the camshaft bearings.

The camshaft drive gear bushing is pressure lubricated through a drilled passage from the front main bearing. The gear has small oil passages machined on both sides which allow the oil to escape.

The timing gears are lubricated by oil from the cam follower chamber and the pressure lubricated camshaft drive gear bushing.

On the 4-cylinder engines, the dynamic balancer is lubricated through a drilled passage from the cylinder block intermediate thrust bearing web to the balancer housing. Oil flows through the balancer housing to the drilled balancer gear shafts and onto the bushings in the balancer gears.

Cylinder walls, pistons and piston pins are splash lubricated by the connecting rods and rotating crankshaft.

An intermittent flow of oil is directed to the valve rocker arm shaft assembly via a drilled passage in the cylinder block located vertically above the No. 1 camshaft bearing. This drilling aligns with a corresponding hole in the cylinder head. As the camshaft turns, holes in the camshaft and camshaft bearing align and a regulated stream of oil is directed to the cylinder head and on up the rocker arm shaft support bolt to the rocker shaft. The oil flows from the shaft through drilled holes in each rocker arm bushing to lubricate both ends of the arms. Excess oil flows down the push rods and assists in lubricating the cam followers before draining back into the sump through cored openings in the block.

On the 4-cylinder turbocharged engine a water-to-oil type oil cooler, located in the base of the radiator is connected into the lubrication system main oil gallery and cools a proportion of the circulating oil. A restrictor at the oil outlet limits the flow to the cooler and maintains internal lubrication at low engine speeds. Return oil from the cooler is fed back to the engine sump via a pipe tapped into the skirt of the cylinder block.

## B. ENGINE—OVERHAUL

### CYLINDER HEAD, VALVES AND RELATED PARTS

#### REMOVAL

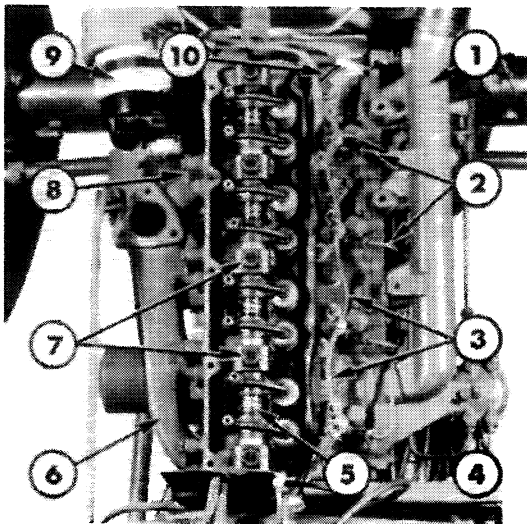
**NOTE:** *The cylinder head can be removed with the engine installed in the tractor.*

1. Disconnect the battery.

Ford 2600, 3600, 4100, 4600, 5600, 6600 and 7600:

- Remove the battery and battery tray.
- Remove the vertical muffler (where fitted).

2. Drain the radiator and cylinder block.



**Figure 5**

4-Cylinder Engine with Rocker Arm Cover Removed

1. Intake Manifold
2. Injection Tubes
3. Leak-Off Tubes
4. Fuel Filter
5. Rocker Shaft Assembly
6. Exhaust Manifold
7. Rocker Shaft Retaining Bolts
8. Tab Washer
9. Alternator
10. Cold Start Tube

3. Shut off the heater hose taps then disconnect and plug the heater hoses.
4. Remove the radiator top hose.
5. Shut off the main fuel tank tap.

Ford 2600, 3600, 4100, 4600, 5600, 6600 and 7600:

- Remove the hood panel assembly.
- Remove the radiator shell support.
- Remove the two bolts securing the fuel tank to the hood rear support.
- Disconnect the horizontal type exhaust pipe (where fitted) from the exhaust manifold.
- Disconnect the air inlet hose at the clamp at the intake manifold.

Ford 6700 and 7700:

- Remove the main fuel tank. See "FUEL SYSTEMS"—Part 2.

6. Disconnect and remove the rocker cover ventilation tube.

Ford 7600 and 7700:

- Remove the turbocharger assembly. See "FUEL SYSTEMS"—Part 2.

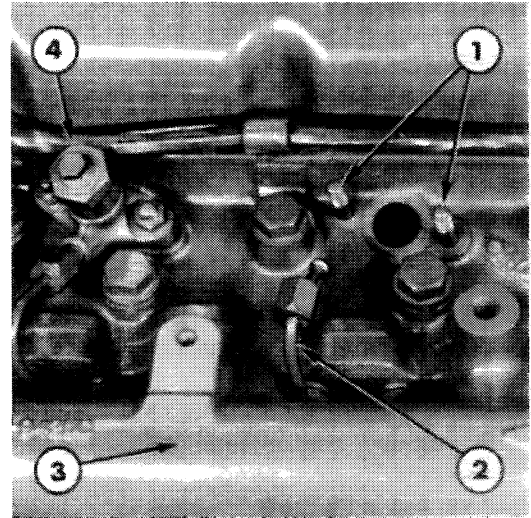
7. Disconnect the alternator, oil pressure, temperature sender, air cleaner restriction indicator and cold start wiring harness connections (where fitted).

8. Remove the alternator and guard (where fitted), Figure 5.

Ford 2600, 3600, 4100, 4600, 5600, 6600 and 6700:

- Remove the vertical type exhaust pipe and bracket (where fitted).

9. Bend the lock tabs back, withdraw the attaching bolts and remove the exhaust manifold and gasket.
10. Disconnect the cold start equipment (where fitted).
11. Remove the injector lines from the fuel injection pump and the injectors. Cap the exposed openings in the pump, injectors and tube ends.
12. Disconnect the fuel lines and remove the fuel filter(s) from the inlet manifold.
13. Withdraw the retaining bolts and lock-washers and remove the inlet manifold and gasket.



**Figure 6**

**Fuel Injector Removed**

1. Fuel Injector Mounting Studs
2. Fuel Injection Tube
3. Intake Manifold
4. Fuel Injector Assembly

Ford 6700 and 7700:

- Place a block under the hood frame rear support and remove the four bolts attaching the support to the rear of the cylinder head.

14. Withdraw the securing bolts and remove the rocker arm cover and gasket from the cylinder head.
15. Disconnect the fuel injector leak-off pipes. Clean the area surrounding the fuel injectors then remove the stud nuts and carefully withdraw the fuel injectors and washers, Figure 6.
16. Check the push rods for straightness by rotating the rods with the valve closed and identify any bent rods.

17. Loosen the rocker shaft retaining bolts, which also serve as cylinder head bolts, evenly and alternately. Remove the rocker shaft assembly.

**NOTE:** Leave the bolts in the rocker shaft supports during removal as they retain the supports on the shaft.

18. Remove the push rods and place in a numbered rack.
19. Remove the remaining cylinder head bolts and washers working inwards from the ends to the centre of the head.
20. Lift the cylinder head from the block. If necessary lever the head off on the pads provided, taking care not to damage the cylinder head or block faces.

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