

FORD

OWNER'S MANUAL

DIESEL TRACTOR SUPPLEMENT

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Prepared by
**TRACTOR AND IMPLEMENT DIVISION
FORD MOTOR COMPANY**

Reprinted

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FOREWORD

Your new Ford Diesel Tractor is basically the same (except for the power source) as the Ford gasoline tractors.

The information in this manual covers only the portions of your tractor differing from the gasoline model and is provided as a supplement to the regular Owner's Manual included with your tractor.

For complete operation and maintenance instructions on your Ford Diesel Tractor, refer to both the Owner's Manual and this supplement.

TRACTOR AND IMPLEMENT DIVISION
FORD MOTOR COMPANY
SERVICE DEPARTMENT

THE DIESEL TRACTOR—GENERAL INFORMATION

The difference between the diesel and gasoline tractor lies mainly in the method of fuel supply and subsequent fuel ignition.

Over the last twenty years, the diesel engine has been widely used in heavy commercial vehicles and tractors. However, it is only now coming into service in the lighter types of vehicles and tractors.

FOUR STROKE CYCLE

Most high speed diesel engines work on the four stroke cycle principle. Each group of four piston strokes—down, up, down, up—is known as a cycle. In Figure 1, the same piston is seen in each of the four strokes completing the cycle which is described below.

Intake Stroke: During this stroke, the piston travels down the cylinder and draws in air through the open intake valve. The exhaust valve remains closed during this stroke. It should be noted that, unlike the gasoline engine, only filtered air and not a mixture of air and fuel is drawn into the cylinder.

Compression Stroke: Both valves are closed during this stroke when the piston comes up and compresses the air. The action of the piston in compressing the air raises the temperature and pressure.

Power Stroke: When the piston approaches the top of the cylinder, a fine spray of fuel is injected into the cylinder by means of the injection pump and injector. The increased pressure of the air and the resulting high temperature causes the finely atomized fuel to ignite. Both valves being closed, the pressure of the expanding gases forces the piston down the cylinder.

Exhaust Stroke: The cycle is completed on the exhaust stroke. The piston moves up and expels the burned gases through the open exhaust valve. The intake valve remains closed throughout this stroke.

COMPRESSION RATIO

The fuel injected into the diesel engine cylinder, in the form of a fine spray, is ignited solely by the high temperature of the air charge within the cylinder. To obtain this high temperature, it is necessary to employ a high compression ratio. This means simply that the total volume of air drawn into the cylinder during the intake stroke has to be compressed into a very small volume when the piston reaches the top of its stroke.

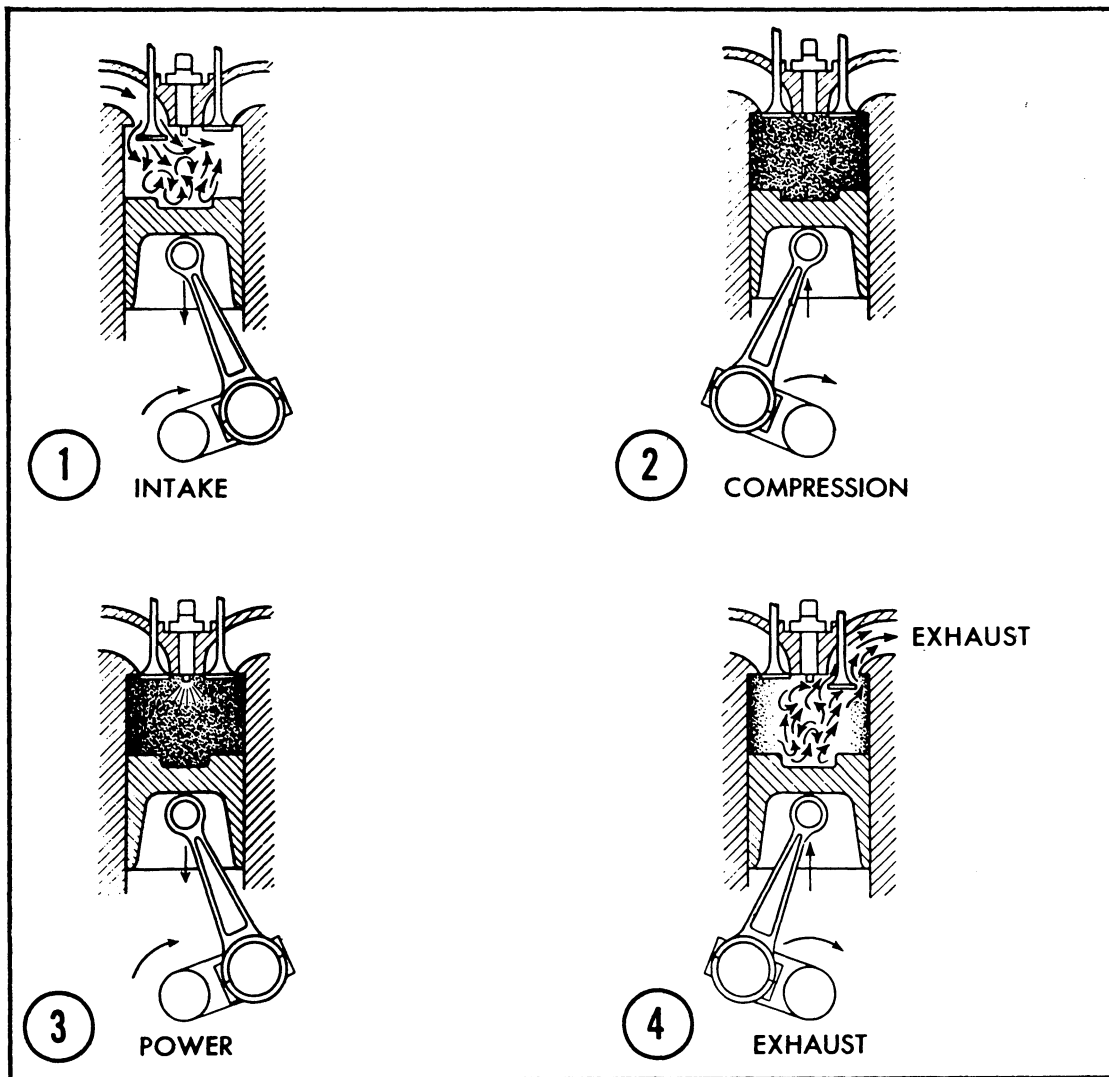


Figure 1
Four Stroke Cycle

The ratio of these two volumes in the Ford Diesel engine is 16.8 to 1. For comparison, the Ford gasoline engine compression ratio is 7.5 to 1. Remember, however, that the fuel in the gasoline engine is ignited not by the heat generated during the compression stroke, but by an electrical spark.

These higher compression ratios and their resulting high working pressures necessitate using parts which are stronger than those used in a gasoline engine.

FUEL SUPPLY

The fuel supply to the combustion chamber is controlled by an injection pump. This pump meters and distributes the fuel under pressure to the individual injectors, which in turn spray (atomize) the fuel into each combustion chamber.

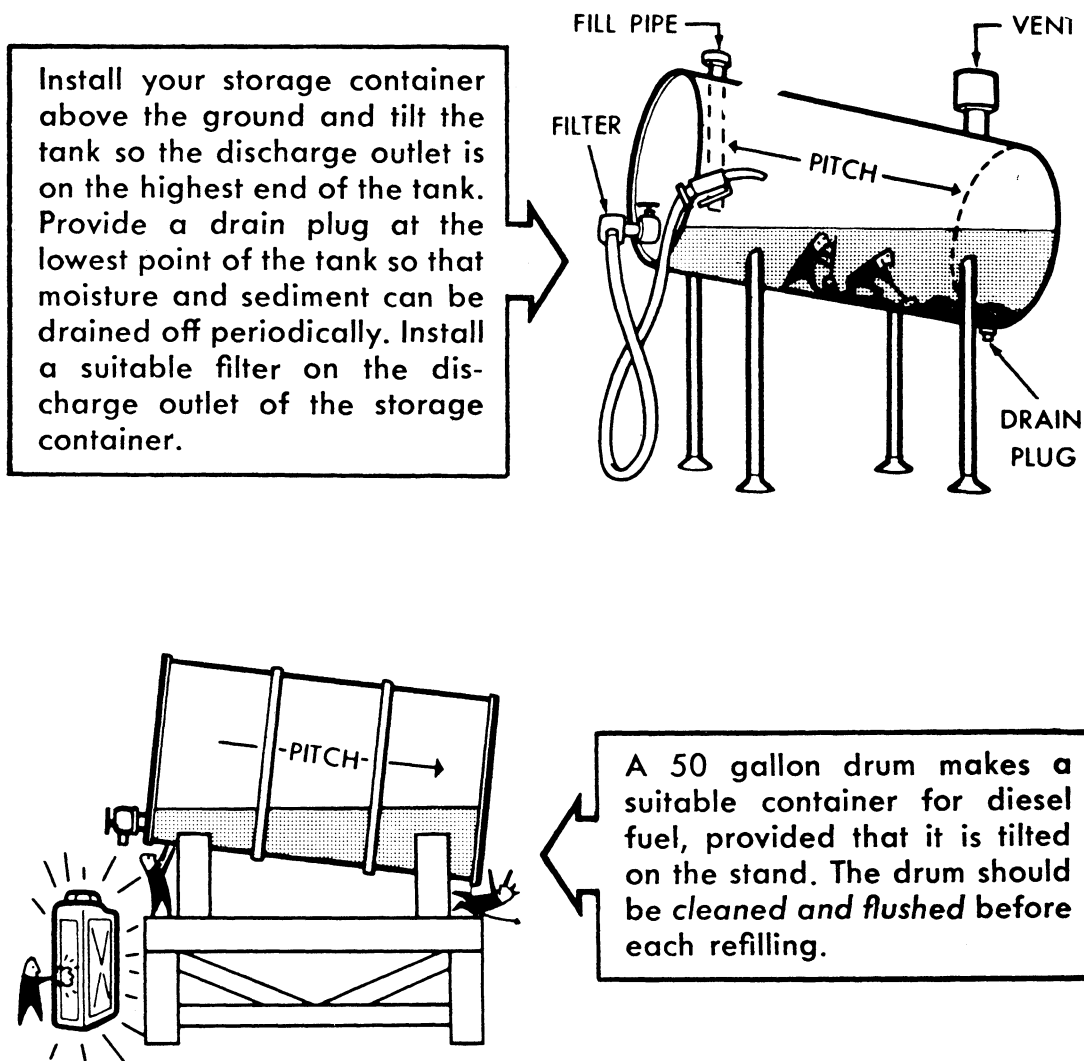


Figure 2
Diesel Fuel Storage

The volume of fuel supplied to the engine is controlled by a metering device within the pump which is activated by the governor mechanism. The high pressure required to operate the injectors is created by internal mechanisms within the pump and the distribution of the fuel to each injector in the proper firing order is controlled by the relationship of the various passages within the pump. The injection pump is driven by the engine camshaft.

DIESEL FUEL STORAGE

The tolerances of the closely fitted injector components and fuel injection pump parts are held within millionths of an inch, so it is vitally important that they be kept free from the damaging action of minute particles of dirt that may enter the fuel—*particularly during fuel handling or storage*. See Figure 2.

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