

Introduction

The engine is the power plant of a vehicle. Automotive engines have gone through tremendous changes since the automobile was first introduced in the 1890s, but all combustion engines still have three requirements that must be met to do their job of providing power – air, fuel, and ignition. The mixture of air and fuel must be compressed inside the engine in order to make it highly combustible and get the most out of the energy contained in the fuel mixture. Since the mixture is ignited within the engine, automobile power plants are called **internal combustion engines**. Most can be further classified as **reciprocating piston engines**, since pistons move up and down within cylinders to provide power. This up-and-down motion is converted into turning motion by the crankshaft.

This course will provide an introduction to automotive engines and engine repair. Subjects covered will include:

- Major engine components
- Engine classifications
- The four stroke cycle and other engine design operations
- Engine construction
- General engine mechanical diagnosis
- Engine removal and installation
- Cylinder head and valve train diagnosis and repair
- Engine block assembly diagnosis and repair

Unit 1 - Basic Engine Parts and Operation

Unit Objective:

After completion of this unit, students should be able to identify internal combustion engine components and their modes of operation.

Specific Objectives:

- Identify engine design associated terms and definitions
- Identify internal combustion engine components
- Understand and be able to explain basic internal combustion engine operation
- Identify common internal combustion engine design classifications

A small engine, such as one found in a lawn mower, usually contains only one cylinder and piston. Automotive engines use a number of cylinders to produce sufficient power to drive the wheels, but operate much like a small engine in many ways. Let's look at one cylinder of an engine to see how the main parts work together.

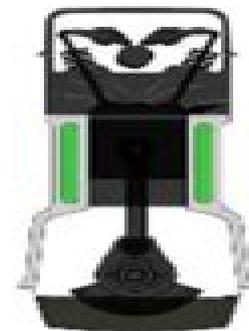
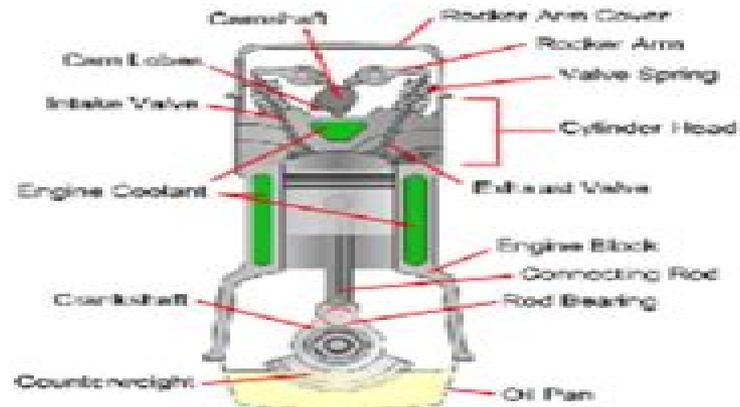
Engine Block

The block, highlighted at right in grey, is a heavy metal casting, usually cast iron or aluminum, which holds the lower parts of the engine together and in place. The block assembly consists of the **block**, or **crankshaft**, **main bearings** and **caps**, **connecting rods**, **pistons**, and other components, and is referred to as the **bottom end**. The block may also house the **camshaft**, **oil pump**, and other parts. The block is machined with passages for oil circulation called **oil galleries** (not shown) and for coolant circulation called **water jackets**.

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Some of the main engine components



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Rachel Sandford



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