

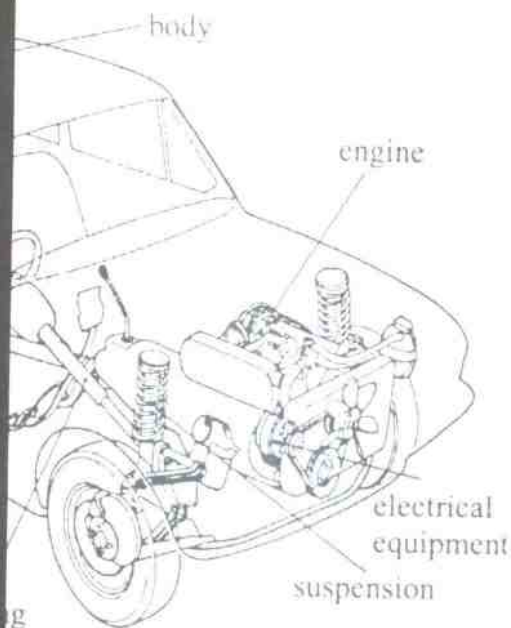
主编 李俊玲 罗永革

MODERN AUTOMOBILE ENGLISH

专业英语

现代汽车

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北京理工大学出版社

# 现代汽车专业英语

**MODERN AUTOMOBILE ENGLISH**

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北京理工大学出版社

## 内 容 提 要

本书是一本全面概括介绍现代汽车构造和维修的通俗性专业英语教材。全书共八个单元,包括课文、词汇注释及复习思考题,书后附有总词汇表。本书可作为大中专院校汽车相关学科的专业英语教材或课外读物,也非常适合于通过英语了解当代汽车的专业科技人员、英语工作者和英语爱好者阅读。

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# 前 言

从第一辆汽车诞生到现在,汽车已有一百多年的历史。在这一百多年里,汽车的发展给人类社会带来了巨大而深刻的变化。在当今社会里,汽车成为越来越多的人日常生活中不可分割的“伙伴”。

本书英文材料通俗易懂,并配有适量的插图,尽量做到图文并茂。全书共八个单元,以介绍现代汽车构造和维修保养为主,并对汽车新技术像汽油喷射、电子点火、ABS、自动变速器和主动悬架等也有概述。为了便于学习,书中对难词、词组及专业词汇做了注释,各章节后配有复习思考题,书后附有总词汇表。

本书可作为各类大中专院校汽车相关学科的专业英语教材或课外读物,也非常适合于通过英语了解当代汽车的科技人员、英语工作者和英语爱好者使用。

本书在编审过程中,得到了李莹、杨朝阳等老师的大力帮助,在此表示衷心的感谢。由于时间仓促,水平有限,书中难免有不妥之处,敬请批评指正。

编 者

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# CHAPTER 1 AUTOMOTIVE BASICS

## 1.1 Principal Components

Today's average car contains more than 15,000 separate, individual parts that must work together. These parts can be grouped into four major categories: engine, body, chassis and electrical equipment [Fig. 1-1].

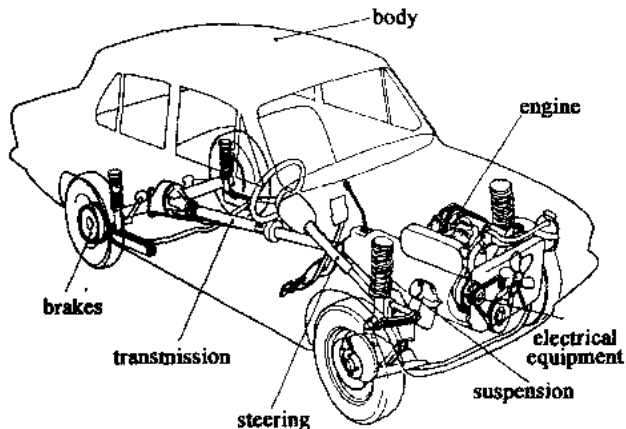


Fig. 1-1 Layout of a modern automobile

### 1.1.1 Engine

The engine acts as the power unit. The internal combustion engine is most common: this obtains its power by burning a liquid fuel inside the engine cylinder. There are two types of engine: gasoline (also called a spark-ignition engine) and diesel

(also called a compression-ignition engine). Both engines are called heat engines; the burning fuel generates heat which causes the gas inside the cylinder to increase its pressure and supply power to rotate a shaft connected to the transmission.

### **1.1.2 Body**

An automobile body is a sheet metal shell with windows, doors, a hood, and a trunk deck built into it. It provides a protective covering for the engine, passengers, and cargo. The body is designed to keep passengers safe and comfortable. The body styling provides an attractive, colorful, modern appearance for the vehicle.

### **1.1.3 Chassis**

The chassis is an assembly of those systems that are the major operating parts of a vehicle. The chassis includes the transmission, suspension, steering, and brake systems.

- **Transmission system** — conveys the drive to the wheels. The main components are clutch, gearbox, driveshaft, final drive, and differential.
- **Suspension** — absorbs the road shocks.
- **Steering** — controls the direction of movement.
- **Brake** — slows down the vehicle.

### **1.1.4 Electrical Equipment**

The electrical system supplies electricity for the ignition, horn, lights, heater, and starter. The electricity level is maintained by a charging circuit. This circuit consists of the battery, alternator (or generator). The battery stores electricity.

The alternator changes the engine's mechanical energy into electrical energy and recharges the battery.

### New Words

principal component			主要部件
category	[ˈkætɪgəri]	n.	种类, 类型
body	[ˈbɒdi]	n.	车身
chassis	[ˈʃæsi]	n.	底盘
layout	[ˈleɪaʊt]	n.	布置
power unit			动力装置
internal combustion engine			内燃机
cylinder	[ˈsɪlɪndə]	n.	汽缸
gasoline	[ˈgæsəli:n]	n.	汽油
spark	[spɔ:k]	n.	火花
ignition	[ɪgˈniʃən]	n.	点燃, 点火
diesel	[ˈdi:zəl]	n.	柴油机
compression	[kəmˈpreʃən]	n.	压缩
shaft	[ʃɑ:ft]	n.	轴
transmission	[trænzˈmɪʃən]	n.	传动系
sheet metal			金属板
shell	[ʃel]	n.	外壳
hood	[hʊd]	n.	(发动机)罩
trunk deck			行李舱盖
cargo	[ˈkɑ:gəʊ]	n.	货物
styling		n.	样式
assembly	[əˈsembli]	n.	总成, 装配
suspension	[səsˈpenʃən]	n.	悬挂, 悬架
shock	[ʃɒk]	n.	冲击
steering	[ˈstiəriŋ]	n.	转向, 操纵

brake	[breik]	n.	刹车, 制动器
clutch	[klʌtʃ]	n.	离合器
gearbox	[ˈgiəbɒks]	n.	变速器
driveshaft		n.	传动轴
final drive			主减速器, 后桥
differential	[ˌdɪfəˈrenʃəl]	n.	差速器
slow down			(使)慢下来, 减速
horn	[hɔ:n]	n.	喇叭
starter	[ˈstɑ:tə]	n.	起动机
charge	[tʃɑ:dʒ]	v.	充电
alternator	[ˈɔ:ltəneɪtə]	n.	交流发电机

## 1.2 How Automobiles Work

What is the first thing you do to start a car? You put your car key into the ignition lock and turns it. The car key opens a path so that electric current can flow from the car battery to the starter. The starter is just powerful enough to start the engine turning.

Now the engine is running smoothly and you want to get moving. The gears in the gearbox go to work by connecting the moving parts of the engine to the wheels. There are at least three sets of gears in the gearbox. The first set of gears have the hardest work of all, to start the car moving. When the next set of gears are used, the car picks up speed. Finally, when the car is moving easily, the gears are shifted again. We say then that the car is in high gear.

Every car has a clutch, which takes the pressure off the gears so they can shift. In some cars the driver has to step on a pedal to release the clutch, then shift the gears with a lever. In

other cars all the shifting is automatic.

The gears in the gearbox multiply the torque from the engine, and send it back to the rear axle by way of the driveshaft. The driveshaft has joints, just as your arms and legs have. The joints allow the shaft to move up and down as the wheels go over bumps. Where the driveshaft meets the rear axle (which is a rod connecting the back wheels), there is the group of gears called the differential.

These gears turn the rear wheels. They let each wheel turn at its own speed when it is necessary. If the car is turning a corner, the outside wheel has to turn faster than the inside one, which acts as a sort of pivot.

Other gears connect the steering wheel to the front wheels which steer the car while the rear wheels push.

The foot brake pedal and the hand brake are connected to the wheels too. When you press on the foot brake, friction bands push hard against the wheel drums and stop the wheels from turning. The hand brake is connected to the brake shoes on the rear wheels.

On the instrument panels are several instruments which tell what's going on under the hood.

The gas gauge tells how much gasoline is in the tank. The oil gauge tells if the engine is getting enough oil. (A thin film of oil has to keep flowing around all the moving parts of the engine to keep them working smoothly and safely.)

The ammeter tells if the generator is sending new electricity into the battery. This should be happening most of the time when the engine is running.

The temperature gauge tells if the engine is being cooled e-

nough. If there is not enough water in the radiator, or if the fan isn't blowing enough air back across the pipes, the engine gets too hot.

The speedometer tells how fast the car is moving. It does this by measuring how fast the wheels are turning.

### New Words

ignition lock			点火锁
electric current			电流
pick up			加速
shift	[ʃift]	v.	移动, 变速
high gear			高速档
pedal	[ˈpedl]	n.	踏板
lever	[ˈli:və]	n.	操纵杆, 杠杆
multiply	[ˈmʌltiplai]	v.	增加
torque	[tɔ:k]	n.	转矩
rear axle			后车轴
joint	[dʒɔint]	n.	联轴器, 连接
go over			越过
bump	[bʌmp]	n.	凸缘
pivot	[ˈpivɔt]	n.	支点
steering wheel			方向盘
friction band			摩擦片
wheel drum			车轮鼓
brake shoe			刹车蹄
instrument panel			仪表盘
gauge	[geɪdʒ]	n.	表, 计量器
gas gauge			燃油表
oil gauge			机油表

film	[film]	n.	(油)膜
ammeter	[ˈæmitə]	n.	安培计
radiator	[ˈreɪdiətə]	n.	散热器
speedometer	[spiˈdɒmitə]	n.	里程表

### 1.3 Types of Chassis Layout

The manufacturer is in business to sell cars so he must design his product to meet the buyer's general requirements. Various engine and drive systems are used; each one has advantages which are shown in the table.

Engine position	Driving wheels	Advantages
Front	Rear	1 Fairly even load applied to each wheel 2 Main components easily removed 3 Simple type of universal joint is used
Front (mounted across the vehicle)	Front	1 Lower floor gives good cornering and low car gives small air resistance 2 Short car 3 Flat floor, no propeller shaft tunnel or gear-box protrusions 4 Majority of weight at front gives good grip and good cornering
Rear	Rear	1 Large load on driving wheels gives good grip 2 Compact layout, short car 3 Simpler drive shaft layout than FWD (front-wheel drive)

#### New Words

in business

经商

driving wheel

驱动轮

universal joint			万向节
mount	[maunt]	v.	安装, 固定, 悬置
propeller shaft			传动轴
protrusion	[prə'tru:ʒən]	n.	露出, 突出
grip	[grip]	n./v.	附着力, 抓牢
compact	[kəm'pækt]	a.	紧凑的

### Review Questions(1.1—1.3)

1. List the main parts of an automobile.
2. What does the chassis include?
3. How does an automobile work?
4. What are the main instruments on the instrument panel?
5. What does the abbreviation FWD stand for?



## **CHAPTER 2 ENGINE**

### **2.1 The Internal Combustion Engine**

#### **2.1.1 Gas Expansion**

When a gas is heated it tries to expand — if this expansion is resisted then a high pressure is built up which in turn creates a large force.

A mixture of petrol and air compressed in a cylinder makes an explosive gas. When the gas is ignited the pressure moves the piston towards the open end of the cylinder.

Linking the piston by a connecting rod to a crankshaft causes the gas to rotate the shaft through half a turn. The power stroke “uses up” the gas, so means must be provided to expel the burnt gas and recharge the cylinder with a fresh petrol-air mixture; this control of gas movement is the duty of the valves; an inlet valve allows the new mixture to enter at the right time and an exhaust valve lets out the burnt gas after the gas has done its job.

#### **2.1.2 Engine Terms [Fig. 2-1]**

- TDC (top dead center) — the position of the crank and piston when the piston is farther away from the crankshaft.