

汽车检修 **一学通** 丛书

# 图解 汽车维修英语

Vehicle Maintenance

文艳玲 谭克诚 编



机械工业出版社  
CHINA MACHINE PRESS



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本书采用图解英语的形式进行编写,每个模块都配有生词解释和练习题,能够帮助读者很好地学习汽车专业英语。书末还附加了目前世界上主流汽车品牌的英文名称及其所属国家,以及汽车标志及其英文名称。

本书分为4大模块,23个单元。内容涵盖了汽车(特别是轿车)大部分系统或总成的工作原理、诊断与维修技术等主题。内容包括:汽车基本组成、汽车分类、汽车车辆识别代码、汽车主要技术参数、发动机基本工作术语、发动机基本构造、发动机的分类、发动机工作原理、电控燃油喷射系统、配气机构、发动机点火系统、发动机起动系统、发动机润滑系统、发动机冷却系统、传动系统、制动系统、转向系统、悬架系统、汽车车身、汽车仪表、汽车空调系统、汽车防抱死制动系统、汽车安全气囊系统、汽车全球定位系统、汽车巡航系统等。

本书图文并茂,内容丰富,适合作为汽车维修专业的专业英语教材,也可作为汽车企业非汽车专业工作人员的汽车英语学习用书,还可以作为汽车维修人员、汽车设计人员的学习用书。

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# 前 言

近年来,我国的汽车工业迅猛发展,汽车保有量飞速增加。汽车行业与国外的技术交流也日益频繁,汽车维修与服务人员需要阅读大量的英文资料,对其英文水平的要求越来越高。为了适应形势的发展,作者编写了本书。

本书旨在培养汽车专业学生和汽车相关技术人员的英文阅读理解、翻译和资料查询等能力,通过本书的阅读和翻译练习能直接从中获取大量有关汽车方面的信息。

本书实用性强,选材新颖,贴近企业,紧密结合专业,重点突出,针对性强;尤其在练习的编排上,突出了专业英语的特色,设计独特,读者通过练习既能学到英语,又能学到汽车方面的知识,如“识别汽车车标”等,可谓一举两得。

本书分为4大模块,23个单元。内容涵盖了汽车(特别是轿车)大部分系统或总成的工作原理、诊断与维修技术等主题。第1模块内容包括:汽车基本组成、汽车分类、汽车车辆识别代码、汽车主要技术参数与发动机基本工作术语;第2模块内容包括:发动机基本构造、发动机的分类、发动机工作原理、电控燃油喷射系统、配气机构、发动机点火系统、发动机起动系统、发动机润滑系统、发动机冷却系统;第3模块内容包括:传动系统、制动系统、转向系统、悬架系统;第4模块内容包括:汽车车身、汽车仪表、汽车空调系统、汽车防抱死系统、汽车安全气囊系统、汽车全球定位系统、汽车巡航系统。

通过对本书的学习,读者可以进一步巩固已掌握的词汇和语法知识,扩大专业词汇量,熟悉专业英语的表达方式,掌握阅读专业英语的方法,为获取相关的专业信息打下良好的基础。

本书可以作为高职高专汽车类专业的教学用书,也可供具有一定英语基础的汽车工程技术人员和有关的管理人员使用。

本书第1、2模块由文艳玲老师编写,第3、4模块由谭克诚老师编写。在编写本书的过程中,得到了东风柳州汽车有限公司许多科技工作者的大力支持,他们提出了许多汽车技术方面的宝贵意见和建议,编者在此深表谢意。

由于编者水平所限,书中难免出现一些缺点和错误,恳请广大读者批评指正,编者在此表示衷心的感谢。

编 者

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# Chapter One Automotive Fundamentals

## Unit 1 Basic Structure of Automobile

An automobile is a kind of road vehicle usually with four wheels which is driven by an engine.

In 1886, a Germany engineer, Gottlieb Daimler, invented the first quadric cycle automobile, which means that the car industry came into being. Nowadays the car industry around the world has a tremendous development, and it has been the major estate, especially in the developed countries, which are famous by BMW, Benz and Volkswagen in German, GM, Ford and Chrysler in America, Toyota, Nissan, Mitsubishi and Honda in Japan. With the rapid development of technology, the automobile has become an important symbol of modern science and technology.

Automobiles are the same in structure, although they are quite different in style and design. In other words, any automobile is composed of four sections, such as engine, chassis, body and electrical system (Fig. 1-1-1).

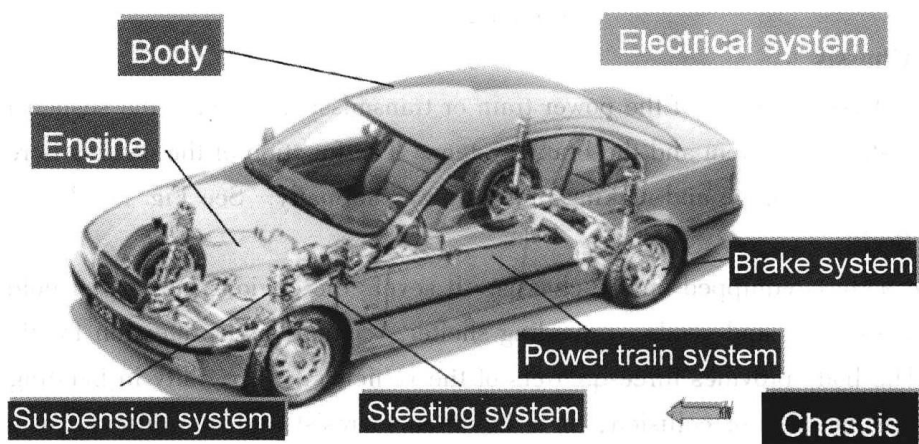


Fig. 1-1-1 Layout of an automobile

### 1. Engine

The engine is the heart of an automobile. The function of an automotive engine is to convert fuel into energy that moves the automobile. Currently the easiest way to cre-



ate motion from fuel is to burn the fuel inside an engine. Therefore, an automotive engine is an internal combustion engine, which burns fuel within the cylinders and converts the expanding force of the combustion into rotary force used to drive the automobile. See Fig. 1-1-2.

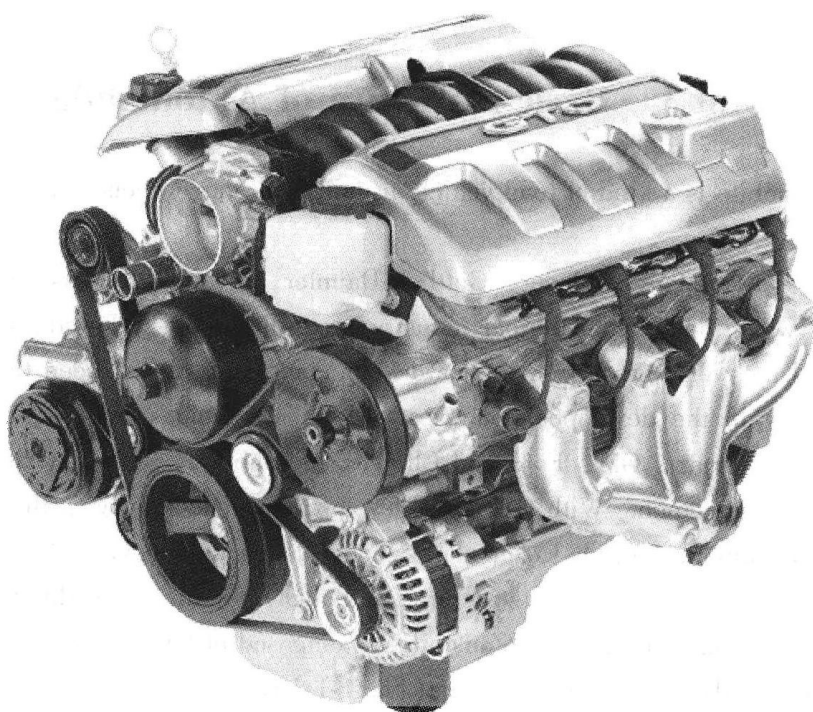


Fig. 1-1-2 Engine

### 2. Chassis

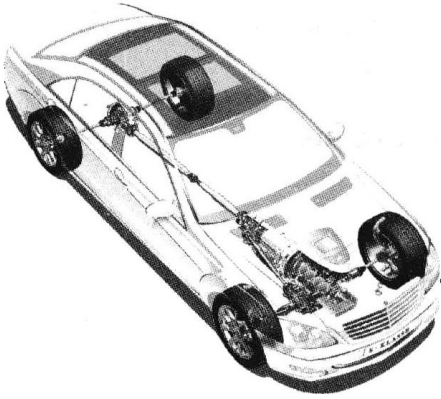
The chassis consists of the power train or transmission system, the suspension system, the steering system and the brake system. The function of the chassis is receiving the power of the engine and making the car move normally. See Fig. 1-1-3.

### 3. Body

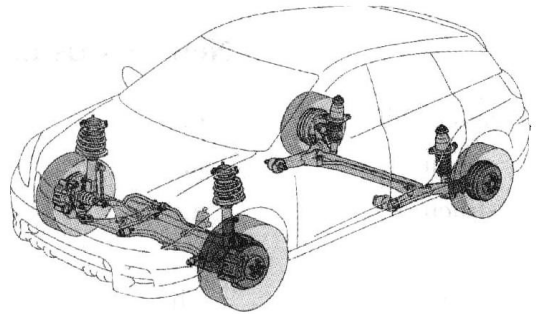
The body is equipped on the chassis. It serves the obvious purpose of holding the driver, passengers and goods, providing shelter, comfort and protection for the occupants. The body provides three-quarters of the vehicle's total rigidity in bending and in torsion. In the case of collision, it is intended to resist and minimize intrusions into the occupant space. The body is designed to keep passengers safe and comfortable. The body styling provides an attractive, colorful, modern appearance for the vehicle.

### 4. Electrical Equipment

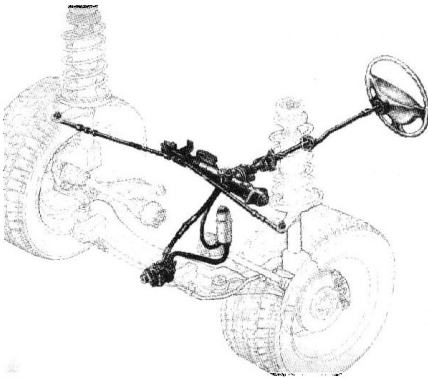
The electrical equipment consists of power and electrical equipment. The power equipment consists of battery and generator. The electrical equipment consists of starting



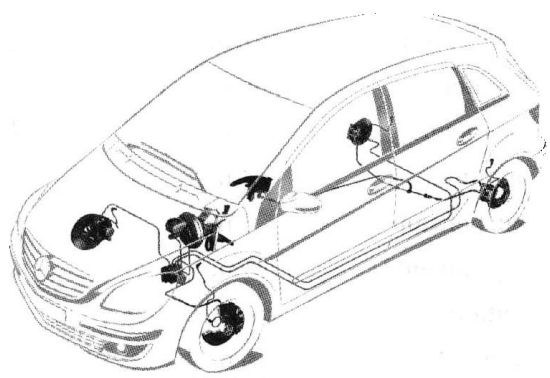
The power train or transmission system



The suspension system



The steering system



The brake system

Fig. 1-1-3 Chassis assembly map

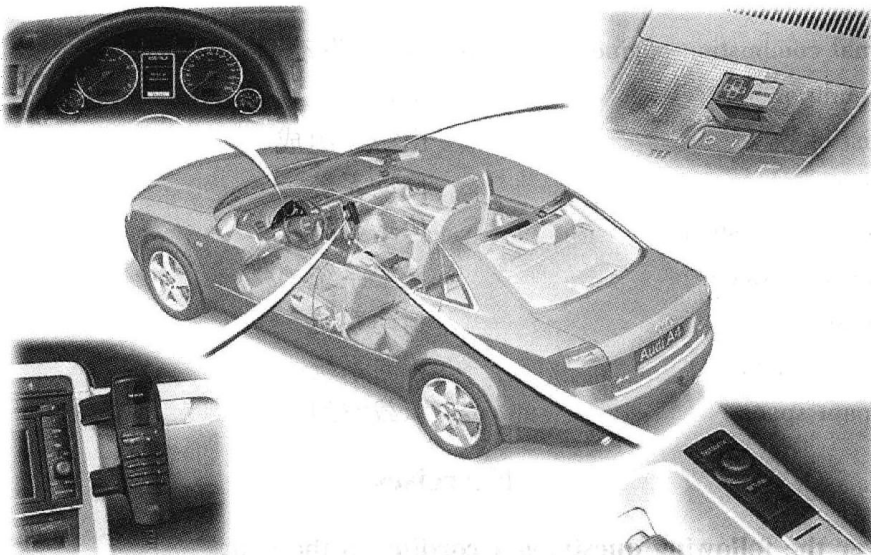


Fig. 1-1-4 Electrical equipment





system, ignition system, lighting system, horn system, instrumentation, air conditioner, audio, wiper and other devices. See Fig. 1-1-4.

### New Words and Expressions

automobile	n.	汽车
engine	n.	发动机
structure	n.	构造
chassis	n.	底盘
electrical	adj.	电的
rotary	adj.	旋转的
transmission	n.	变速器, 传动装置
shelter	n. /v.	保护, 庇护
occupant	n.	乘员
ignition	n.	点燃, 点火
suspension	n.	悬架
equipment	n.	设备
battery	n.	蓄电池
generator	n.	发电机
obvious	adj.	明显的
protection	n.	保护
internal combustion engine		内燃(发动)机
air conditioner		空调
consist of		由……组成
power train		传动系统
transmission system		传动系统
suspension system		悬架系统
brake system		制动系统
steering system		转向系统
occupant space		承载空间

### Exercises

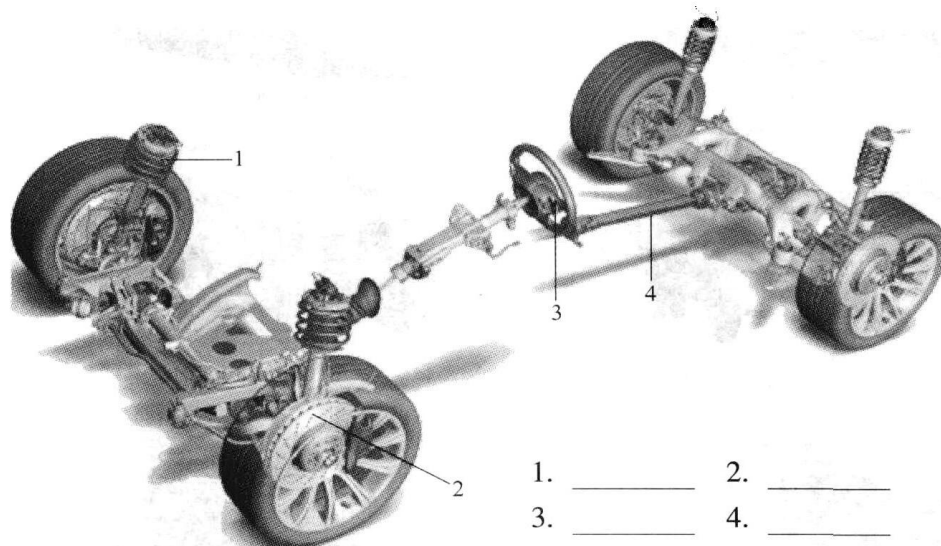
#### I. Answer the following questions according to the text.

1. What are the four basic sections of an automobile?
2. What's the function of the engine?



3. How many systems does the chassis include?
4. What's the function of the body?

## II. Write out the terms according to the picture.



- |          |          |
|----------|----------|
| 1. _____ | 2. _____ |
| 3. _____ | 4. _____ |

## III. Translate the following paragraph into Chinese.

The engine is the heart of an automobile. The function of an automotive engine is to convert fuel into energy that moves the automobile. Currently the easiest way to create motion from fuel is to burn the fuel inside an engine. Therefore, an automotive engine is an internal combustion engine, which burns fuel within the cylinders and converts the expanding force of the combustion into rotary force used to drive the automobile.

## IV. Translate the following sentences into English.

1. 虽然汽车在设计方面有所不同，但在构造上是基本相同的。
2. 底盘包括传动系统、悬架系统、转向系统和制动系统。
3. 任何汽车都是由四部分组成的，如发动机、底盘、车身以及电气系统。
4. 发动机的类型有多种，但最常见的是内燃机。

## Unit 2 The Automobile Classification

The automobile can be classified according to vehicle types, the engine pistons and drive types, drive power types and vehicle body types.

### 1. Classified by Vehicle Types

According to vehicle types, cars can be classified into sedan, coach, truck, and so on. See Fig. 1-2-1.



a) Sedan



b) Coach



c) Truck



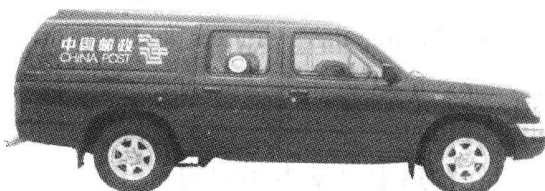
d) Off-road vehicle



e) Right-hand drive truck



f) Dump truck



g) Stock car



h) Agriculture vehicle



i) Special vehicle

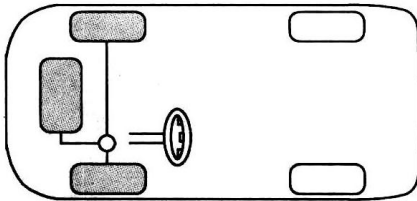
Fig. 1-2-1 Classified by vehicle types

## 2. Classified by the Engine Pistons and Drive Types

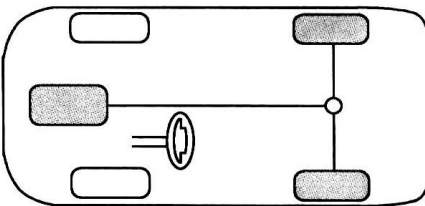
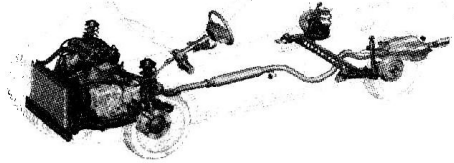
According to the engine pistons and drive types, cars can be classified into front



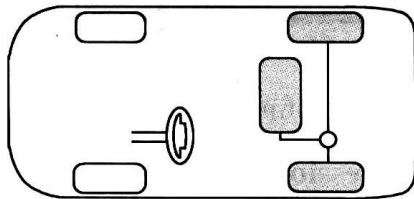
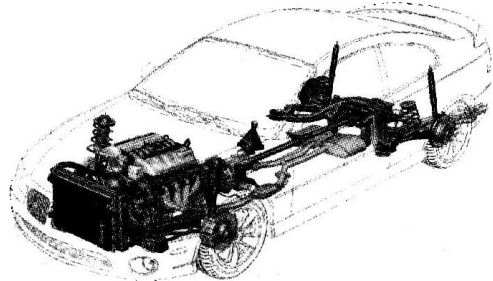
engine front drive(FF) , front engine rear drive(FR) , rear engine rear drive(RR) , middle engine rear drive(MR)and full wheel drive(nWD). See Fig. 1-2-2.



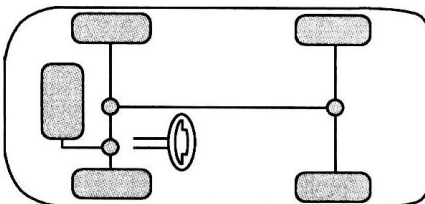
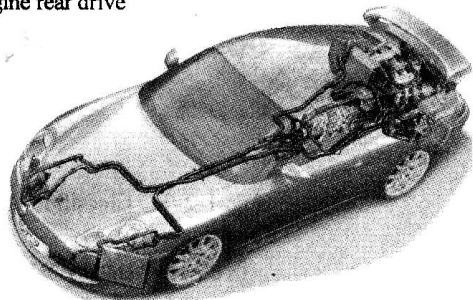
Front engine front drive



Front engine rear drive



Middle engine rear drive



Full wheel drive

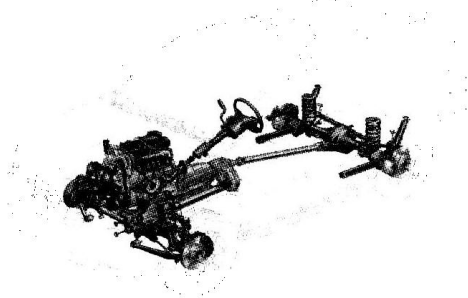


Fig. 1-2-2 Classified by the engine pistons and drive types

## 3. Classified by the Drive Power Types

According to the drive power types, cars can be classified into gasoline engine vehicle, diesel engine vehicle, mix power vehicle, electric vehicle and fuel battery vehicle.



#### 4. Classified by Vehicle Body Types

According to vehicle body types, cars can be classified into three-box, two box, coupe and convertible sedan. See Fig. 1-2-3.

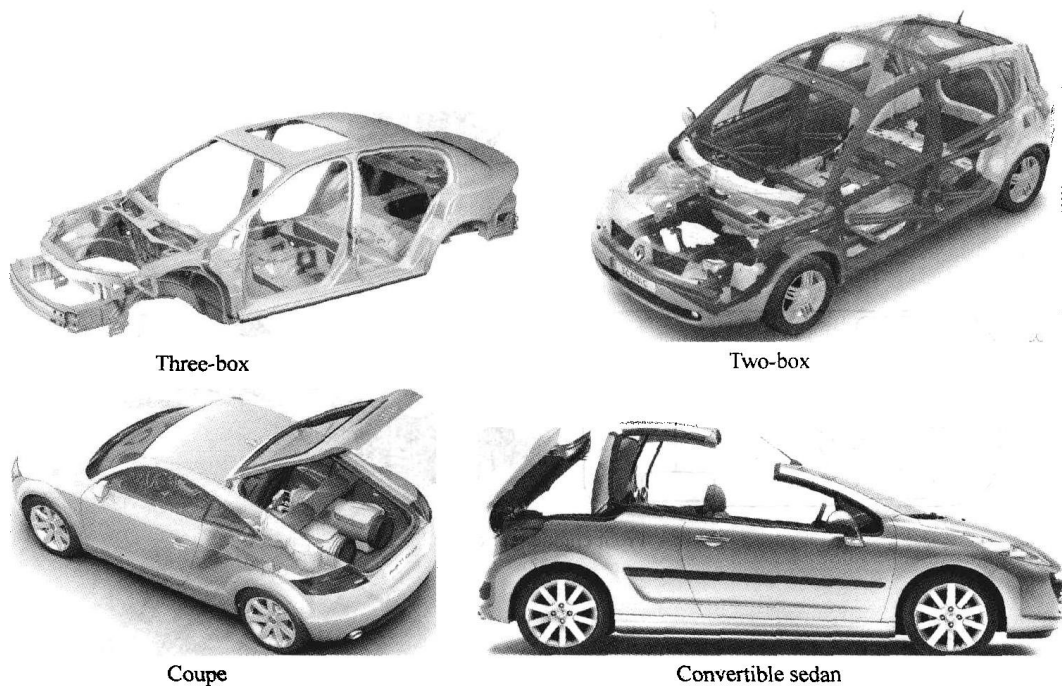


Fig. 1-2-3 Classified by vehicle body types

#### New Words and Expressions

classify	v.	分类
vehicle	n.	车辆
sedan	n.	私家轿车, 轿车
fuel	n.	燃料
gasoline	n.	汽油
wheel	n.	车轮
agriculture	n.	农学, 农业
tractor	n.	拖拉机, 牵引机
off-road vehicle		越野车
front engine front drive(FF)		前置发动机前轮驱动
front engine rear drive(FR)		前置发动机后轮驱动
middle engine rear drive(MR)		中置发动机后轮驱动



rear engine rear drive(RR)

后置发动机后轮驱动

full wheel drive(nWD)

四轮驱动

dump truck

自卸车

gasoline engine

汽油发动机

diesel engine

柴油发动机

electric vehicle

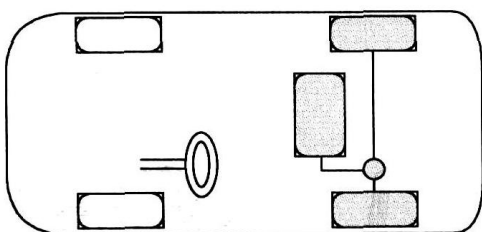
电动车辆

## Exercises

### I. Answer the following questions according to the text.

1. What types can we classify according to the engine pistons and drive types?
2. What types can we classify according to the vehicle body types?
3. What does FF stand for?
4. What does FR stand for?

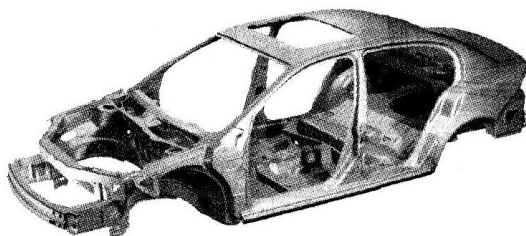
### II. Write out the terms according to the picture.



1. \_\_\_\_\_



2. \_\_\_\_\_



3. \_\_\_\_\_



4. \_\_\_\_\_

### III. Translate the following paragraph into Chinese.

1. According to the engine pistons and drive types, cars can be classified into front engine front drive(FF), front engine rear drive(FR), rear engine rear drive(RR), middle engine rear drive(MR) and full wheel drive(nWD).

2. According to the drive power types, cars can be classified into gasoline engine vehicle, diesel engine vehicle, mix power vehicle, electric vehicle and fuel battery vehicle.



## Unit 3 The Vehicle Technical Parameters

On the vehicle, there is a name plate to show the date of MFD, the plant, the engine, the chassis model, the transaxle, the manufacture shown above, the color trim, the gross vehicle weight rating(GVWR), the vehicle capacity, the size of tyre, the tyre pressure and so on.

Now let's look at the diagrams of this unit.

### 1. The Key Dimension Data of a Vehicle( Fig. 1-3-1)

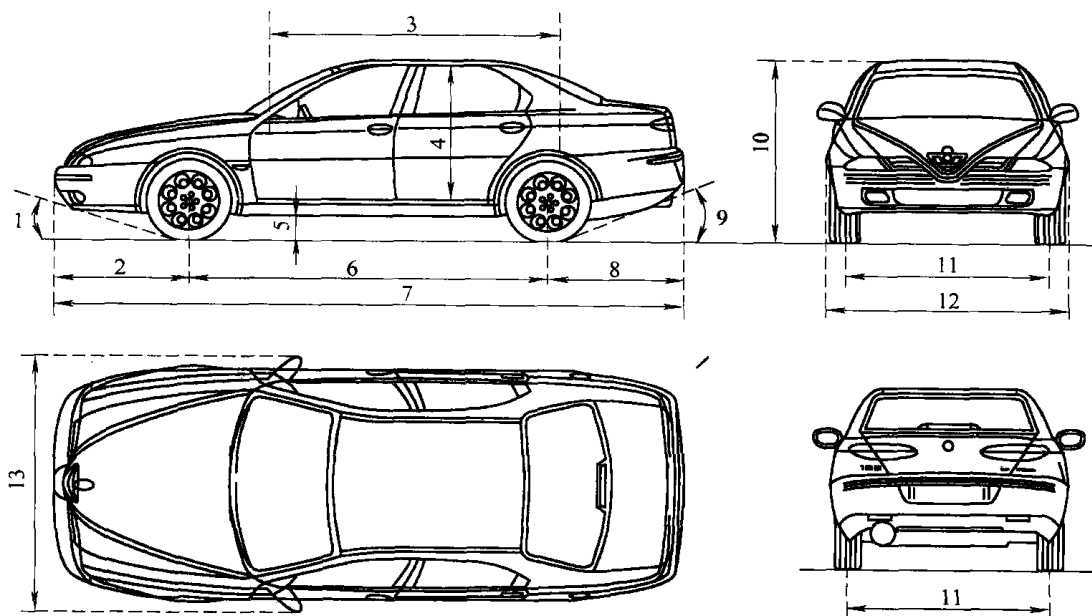


Fig. 1-3-1 The key dimension data of a vehicle

- 1—approach angle 2—front overhang 3—length of body 4—height of body  
5—ground clearance 6—wheel base 7—overall length 8—rear overhang  
9—departure angle 10—vehicle height 11—wheel tread  
12—width of body 13—vehicle width

### 2. Engine Terms( Fig. 1-3-2)

#### (1) Top Dead Center(TDC)

The position of the crank and piston when the piston is farthest away from the crankshaft.

#### (2) Bottom Dead Center(BDC)

The position of the crank and piston when the piston is nearest away from the crankshaft.

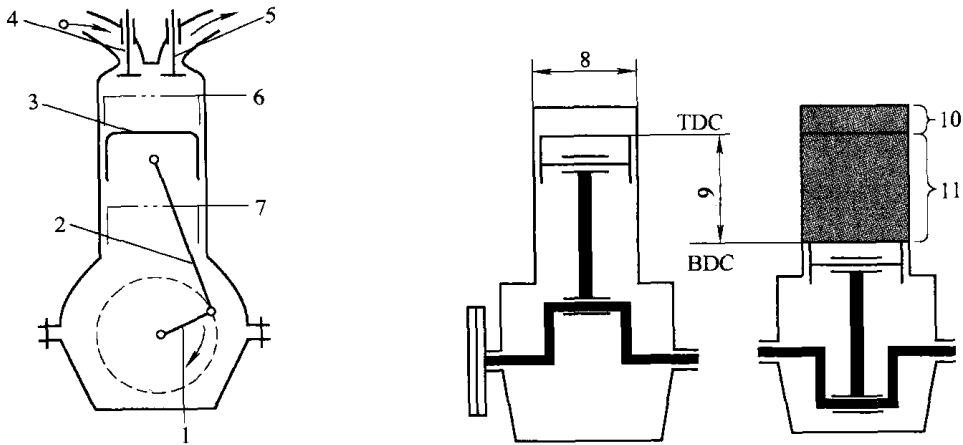


Fig. 1-3-2 Engine terms

- 1—crankshaft 2—connecting rod 3—piston 4—intake valve  
5—exhaust valve 6—TDC 7—BDC 8—bore  
9—piston stroke 10—clearance volume 11—swept volume

### (3) Swept Volume

The volume between TDC and BDC.

### (4) Clearance Volume

The volume of space above the piston when it is at TDC.

### (5) Engine Capacity

This is the swept volume of all cylinders. Generally speaking, the larger the engine capacity is, the higher the engine power is.

### (6) Compression Ratio

It means that the piston compresses the gas mixture which is made from air and fuel (swept vol. + clearance vol.)/(clearance vol.).

### (7) Engine Torque

It means the ability of turning the live axle.

### (8) Specific Fuel Consumption

It means the fuel consumption in the given distance.

### (9) Engine Power

It means the output of the engine in the given time. The unit of measurement is kW.

## 3. Vehicle Labeling

Each vehicle has labels which tell us the date and plant of the vehicle manufacture, type(model), engine number, chassis No., trans or axle number, frame num-





ber, color, trim, GVWR, GAWR, tire size, tire pressure, and so on. These are very important for the vehicle to be used and serviced(Shown in Fig. 1-3-3).

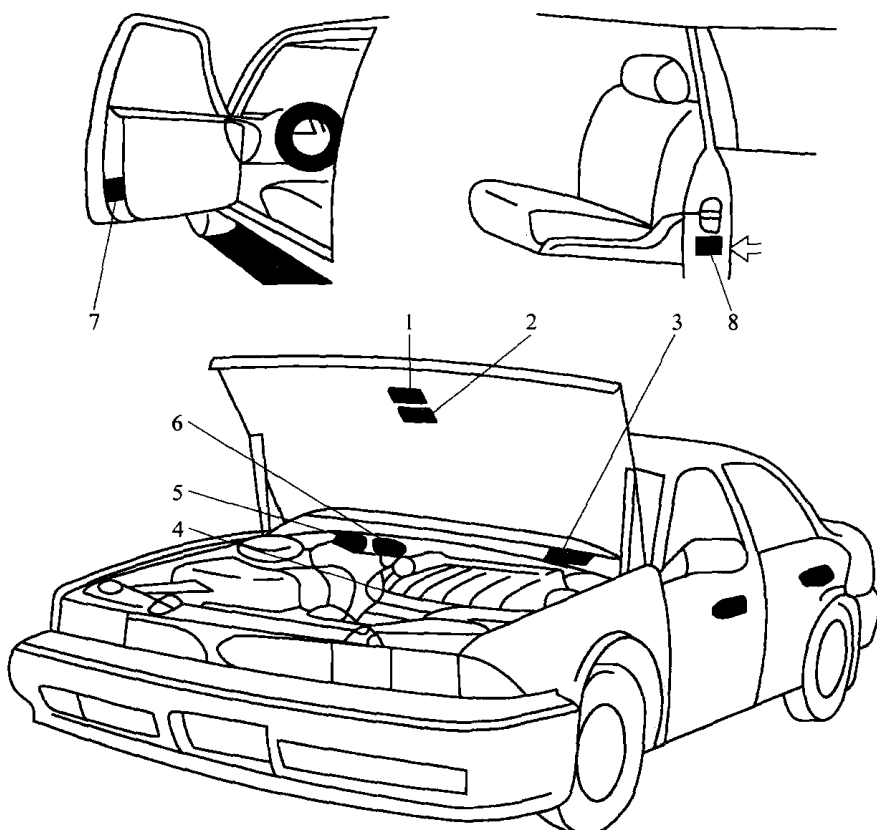


Fig. 1-3-3 Vehicle labeling location

- 1—vehicle emission control information label 2—service points label  
3—vehicle identification number(VIN)plate 4—engine serial number  
5—chassis number 6—vehicle information code plate  
7—tire inflation pressure label 8—certification label

The followings are some manufacturers' vehicle label. See Fig. 1-3-4 and Fig. 1-3-5.

HONDA Label	
MAF in Japan by HONDA MOTOR CO. , LTD 9/1993	
GVWR 1820kg	GAWR F 995kg R 840kg
The vehicle conforms to all applicable federal motor vehicle safety standards in effect on the date of its manufacture.	
VIN: JHMCD 5656 RC 803309	
Passenger car	