

汽车专业英语 读译教程

普通高等教育交通类专业规划教材



宋进桂 主编



机械工业出版社
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汽车专业英语读译教程

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本书以汽车结构为主线,全面介绍了汽车各部分的组成、结构和原理,特别是对电控燃油喷射、共轨喷射、微机控制点火、可变气门定时、自动变速器、无级变速器、防抱死制动系统、牵引控制系统、电子稳定性控制、巡航控制、安全气囊、计算机控制悬架、汽车网络、混合动力和燃料电池等新技术的介绍约占三分之二的篇幅。本书共分14个单元,每个单元包含3篇课文、相关术语和翻译技巧。课文后面有词汇、课文注释和练习题。书末附有词汇总表,以方便查阅。本书可作为交通运输(汽车运用工程方向)、车辆工程和汽车服务工程等汽车类本科专业的教材,亦可供有关工程技术人员学习参考。

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前 言

经过 120 多年的发展,汽车已经成为一种集机械、电子、通信、新材料等多学科门类技术于一身的、结构极为复杂的现代化工业产物。随着科学技术的发展,汽车继续发生着日新月异的变化。为了能够及时地通过各种信息源,了解汽车技术的最新发展现状及动态,促进与世界的交流,为了正确使用现代化的生产设备和工具,解决生产中的实际问题,作为汽车类专业(交通运输、车辆工程和汽车服务工程专业)的本科学生必须具有一定的阅读和翻译汽车专业英语文献的能力。

本教材以巩固汽车专业知识和英语基础,训练和提高对汽车专业英语文献的阅读和翻译能力为根本出发点,对教材内容进行精心选编。课文内容绝大部分直接选自近年出版的英文书刊,为读者提供了最新的信息,并按照介绍汽车结构的一般顺序进行编排,易于掌握。本教材的特点是:内容新颖且可选择性强,方便教学,注重培养读译能力。

本教材共分 14 个单元,每个单元包括 3 篇课文、相关术语和翻译技巧。课文内容包含汽车的总体构造、发动机和底盘的一般常规结构,以及发动机和底盘电气与电子控制系统。对于像电控燃油喷射、共轨喷射、微机控制点火、排放控制、可变气门定时、电控气门、自动变速器、无级变速器、防抱死制动系统、牵引控制系统、电子稳定性控制、巡航控制、安全气囊、计算机控制悬架、汽车网络、混合动力和燃料电池等新技术介绍的内容约占三分之二的篇幅。每篇课文后面有词汇、课文注释和练习题,供使用者学习参考。

每个单元后附有相关术语和翻译技巧,有助于扩大专业词汇量和提高翻译能力。翻译技巧中的例句全部取自本书且主要来自本单元课文。翻译技巧中编入了“论文摘要翻译”,有利于帮助高年级学生提高论文摘要的撰写与翻译能力。书末附有词汇总表,以方便查阅。

随着我国高等教育的发展,人才的培养目标和模式正处于改革探索阶段,高等教育不仅要培养创新型高级研究人才,还要培养应用型高级技术人才。本教材每个单元均设有三篇课文,使用者可以根据培养目标、学习兴趣等对内容进行取舍。侧重于培养创新型高级研究人才的,建议选学 TEXT A 和 TEXT B;侧重于培养应用型高级技术人才的,可选择 TEXT A 和 TEXT C;亦可根据实际情况,自行确定学习内容。

本书可作为交通运输(汽车运用工程方向)、车辆工程、汽车服务工程等汽

IV

车类本科专业的教材，亦可供有关工程技术人员自学参考。

本书由鲁东大学宋进桂任主编，山东理工大学谭德荣、鲁东大学车爱鹏任副主编。鲁东大学杨占鹏、于京诺、陈燕、闫平、李栋、王品、戚宁等参与编写工作。

在本书的编写过程中，得到了鲁东大学交通学院的大力支持，在此表示衷心的感谢。

由于编者水平所限，书中定有不妥甚至错误之处，敬请读者批评指正。

编 者

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UNIT 1 AUTOMOBILE BASICS

TEXT A

The Basic Components of an Automobile

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 equipments.

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].

All engines have fuel, exhaust, cooling, and lubrication systems. Gasoline engines also have an ignition system. The ignition system supplies the electric spark needed to ignite the air-fuel mixture in the cylinders. When the ignition switch is turned on, current flows from the 12-volt storage battery to the ignition coil. The coil boosts the voltage to produce the strong spark of 20,000 V needed to ignite the engine fuel.

The automobile supplies all the electricity it needs through its electrical system. For example, the electrical system supplies electricity for the ignition, horn, lights, heater, and starter. The electricity level is maintained by a charging circuit.

The fuel system stores liquid fuel and delivers it to the engine. The fuel is stored in the tank, which is connected to a fuel pump by a fuel line. The fuel is pumped from the fuel tank through the fuel lines. It is forced through a filter into the carburetor where it is mixed with air, or into the fuel injection system. The fuel is mixed with air to form a combustible mixture in the carburetor, the manifold, or the cylinders themselves^[2].

The cooling system removes excessive heat from the engine. The temperature in

engine combustion chambers is about $2,000^{\circ}\text{F}$ ($1,094^{\circ}\text{C}$). Since steel melts at around $2,500^{\circ}\text{F}$ ($1,354^{\circ}\text{C}$), this heat must be carried away to prevent engine damage. Air and a coolant are used to carry away the heat. The radiator is filled with a coolant. The water pump circulates this coolant through the hollow walls of the engine block and head. Constant circulation of the coolant through the engine and the radiator removes heat from the engine. Heat also is removed by the radiator fan, which draws air through the narrow fins of the radiator. This system also supplies heat to the passenger compartment and the window defrosters.

The lubrication system is important in keeping the engine running smoothly. Motor oil is the lubricant used in the system. The lubrication system has four functions:

- 1) It cuts down friction by coating moving parts with oil;
- 2) It produces a seal between the piston rings and the cylinder walls;
- 3) It carries away sludge, dirt, and acids;
- 4) It cools the engine by circulating the motor oil.

To keep this system working efficiently, oil filters and motor oil must be changed regularly. All other moving parts in an automobile must also be lubricated.

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. It is streamlined to lessen wind resistance and to keep the car from swaying at the driving speeds.

A sedan has an enclosed body with a maximum of 4 doors to allow access to the passenger compartment. The design also allows for storage of luggage or other goods. A sedan can also be referred to as a saloon and traditionally has a fixed roof. There are soft-top versions of the same body design except for having 2 doors, and these are commonly referred to as convertibles (Fig. 1-1).

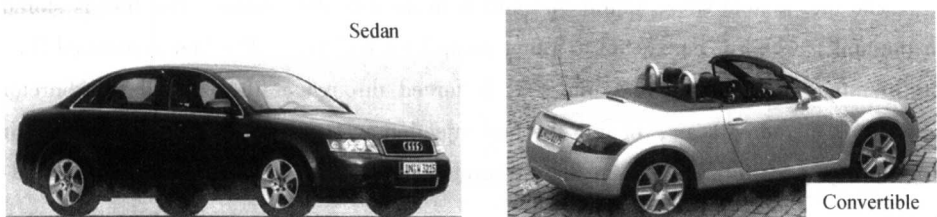


Fig. 1-1 Sedan and convertible

Multi-purpose vans (MPV) can be based on common sedan designs or redesigns so that maximum cargo space is available.

The pick-up carries goods. Usually it has stronger chassis components and suspension than a sedan to support greater gross vehicle mass.

The bodies of commercial vehicles that transport goods are designed for that specific purpose.

Buses and coaches are usually 4-wheel rigid vehicles, but a large number of wheels and axles can be used. Sometimes articulated buses are used to increase capacity. Buses and coaches can be single-deck or double-deck. Buses are commonly used in cities as commuter transports while coaches are more luxurious used for long distances.

Chassis

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

Power Train

The power train system comprises clutch, transmission, propeller shaft, rear axle and differential and the driving road wheels.

The clutch or torque converter has the task of disconnecting and connecting the engine's power from and to the driving wheels of the vehicle. This action may be manual or automatic.

The main purpose of the transmission or gearbox is to provide a selection of gear ratios between the engine and driving wheels, so that the vehicle can operate satisfactorily under all driving conditions. Gear selection may be done manually by the driver or automatically by a hydraulic control system.

The function of the propeller (drive) shaft is to transmit the drive from the gearbox to the input shaft of the rear axle and differential assembly. Flexible joints allow the rear axle and wheels to move up and down without affecting operation.

The rear axle and differential unit transmits the engine's rotational power through 90° from propeller shaft to axle shaft to road wheels. A further function is to allow each driving wheel to turn at a different speed; essential when cornering because the outer wheel must turn further than the inside wheel. A third function is to introduce another gear ratio for torque multiplication.

Suspension System

The axles and wheels are isolated from the chassis by a suspension system. The basic job of the suspension system is to absorb the shocks caused by irregular road surfaces that would otherwise be transmitted to the vehicle and its occupants, thus helping to keep the vehicle on a controlled and level course, regardless of road conditions^[3].

Steering System

The steering system, under the control of the driver at the steering wheel, provides the means by which the front wheels are directionally turned. The steering system may be power assisted to reduce the effort required to turn the steering wheel and make the vehicle easier to manoeuvre.

Braking System

The braking system on a vehicle has three main functions. It must be able to reduce the speed of the vehicle, when necessary; it must be able to stop the car in as short a distance as possible; it must be able to hold the vehicle stationary. The braking action is achieved as a result of the friction developed by forcing a stationary surface (the brake lining) into contact with a rotating surface (the drum or disc).

Each wheel has a brake assembly, of either the drum type or the disc type, hydraulically operated when the driver applies the foot brake pedal.

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 a battery, and an alternator (or generator). The battery stores electricity. The alternator changes the engine's mechanical energy into electrical energy and recharges the battery.

NEW WORDS

component	[kəm'pəunənt]	<i>n.</i> 成分, 组成, 部件, 零件
chassis	['ʃæsi]	<i>n.</i> 底盘
transmission	[trænz'miʃən]	<i>n.</i> 变速器, 传动, 传动系统, 传送, 发射
lubrication	[,lu:bri'keiʃən]	<i>n.</i> 润滑

ignition	[ɪg'niʃən]	<i>n.</i> 点火, 点燃
ignite	[ɪg'nait]	<i>v.</i> 点火, 点燃
boost	[bu:st]	<i>v.</i> 升压, 推进, 增加, 增压, 提高
filter	['fɪltə]	<i>n.</i> 滤清器, 过滤器, 过滤器
carburetor	['kɑ:bjʊretə]	<i>n.</i> 化油器
combustible	[kəm'bʌstəbl]	<i>a.</i> 易燃的
radiator	['reɪdiətə]	<i>n.</i> 散热器, 冷却器, 辐射体
hollow	['hɒləʊ]	<i>a.</i> 空心的, 虚伪的; <i>n.</i> 洞, 窟窿, 山谷
circulate	['sɜ:kjuleɪt]	<i>v.</i> (使)循环, (使)流通
defroster	[,di:'frɒstə]	<i>n.</i> 除冰(或霜)装置
sludge	[slʌdʒ]	<i>n.</i> 软泥, 淤泥
hood	[hud]	<i>n.</i> 发动机罩
styling	['stɑɪlɪŋ]	<i>n.</i> 花[式]样
streamlined	['stri:mleɪnd]	<i>a.</i> 流线型的, 现代化的
sedan	[si'dæn]	<i>n.</i> 轿车, 轿子
enclosed	[ɪn'kləʊzd]	<i>a.</i> 封闭的, 密闭的
pick-up	['pɪkʌp]	<i>n.</i> 拾波器, 皮卡(轻型货车), 传感器
gross	[grɒs]	<i>a.</i> 总的, 毛重的; <i>n.</i> 总额
coach	[kəʊtʃ]	<i>n.</i> 四轮大马车, 长途客车, 教练
rigid	['rɪdʒɪd]	<i>a.</i> 刚硬的, 刚性的, 严格的
axle	['æksl]	<i>n.</i> 轮轴, 车轴
articulated	[ɑ:'tɪkjuleɪtɪd]	<i>a.</i> 铰接(的), 有关节的
capacity	[kə'pæsɪti]	<i>n.</i> 容量, 生产量, 才能, 能力
commuter	[kə'mju:tə]	<i>n.</i> 长期月票使用者
luxurious	[lʌg'zjuəriəs]	<i>a.</i> 奢侈的, 豪华的
suspension	[səs'penʃən]	<i>n.</i> 悬架, 悬浮, 悬浮液, 暂停, 中止, 悬而未决
differential	[,dɪfə'renʃəl]	<i>n.</i> 差速器, 微分; <i>a.</i> 微分的, 差动的
clutch	[klʌtʃ]	<i>n.</i> 离合器
hydraulic	[haɪ'drɔ:lik]	<i>a.</i> 液压的, 水压的, 水力的
isolate	['aɪsəleɪt]	<i>v.</i> 隔离, 孤立, 绝缘, 查出(故障)
course	[kɔ:s]	<i>n.</i> 过程, 经过, 进程, 方针, 路线, 跑道, 课程
manoeuvre	[mə'nu:və]	= manoeuvre <i>v.</i> 策划, 调动, 演习, 操纵, 机动(动作); <i>n.</i> 策略, 调动

drum	[drʌm]	<i>n.</i> 鼓, 鼓声; <i>v.</i> 击鼓
pedal	['pedl]	<i>n.</i> 踏板
torque	[tɔ:k]	<i>n.</i> 转矩, 扭矩

PHRASES AND EXPRESSIONS

spark-ignition engine	点燃式发动机
compression-ignition engine	压燃式发动机
storage battery	蓄电池
ignition coil	点火线圈
charging circuit	充电电路
combustion chamber	燃烧室
passenger compartment	乘客室, 乘客舱
window defroster	风窗除霜器
motor oil	机油
sheet metal	钢板, 金属板
trunk deck	行李箱盖
multi-purpose van (MPV)	多用途厢式车
commercial vehicle	商用汽车
power train	传动系, 动力装置
propeller shaft	= drive shaft 传动轴
torque converter	液力变矩器
gear ratio	传动比
flexible joint	柔性接头
axle shaft	半轴
road wheel	车轮
brake lining	制动器摩擦片

NOTES TO THE TEXT

[1] 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.

在这个长句中, 后一个分句对前面分句进行说明。在后一个分句中, which causes...至句末是一个定语从句。本句可以译为: “这两种发动机均被称为热机。”

在热机中，燃料燃烧产生的热能使气缸内的气体压力升高，并提供动力，使一根与变速器相连的轴转动。”

[2] The fuel is mixed with air to form a combustible mixture in the carburetor, the manifold, or the cylinders themselves.

此句中的介词短语 in the carburetor, the manifold, or the cylinders themselves 内有三个并列的介词宾语，说明可燃混合气形成的地点或者在化油器内(化油器式发动机)，或者在进气歧管内(进气道燃油喷射发动机)，或者在气缸内(缸内直接喷射发动机)。本句可以译为：“燃油在化油器内，或者在进气歧管内，或者就在各个气缸内与空气混合，从而形成可燃混合气。”

[3] The basic job of the suspension system is to absorb the shocks caused by irregular road surfaces that would otherwise be transmitted to the vehicle and its occupants, thus helping to keep the vehicle on a controlled and level course, regardless of road conditions.

在本句中，应注意三点：①that would otherwise be transmitted to the vehicle and its occupants 是 shocks 的定语从句；②thus helping... 现在分词短语作主句的状语，并非定语从句的构成部分；③to keep the vehicle on a controlled and level course 不定式短语的含义是“使汽车保持在可以控制的、笔直的行驶路线上。”本句可以译为：“悬架系统的基本作用是吸收路面不平引起的冲击和振动，使其不会传递给车辆和乘客。这样，不管路况如何，都能使车辆具有可控制的、笔直的行驶路线。”

EXERCISES

I. Answer the following questions:

1. There are two types of engine. What are they?
2. What are the functions of the lubrication system?
3. What are the components of the power train system?
4. What are the three main functions of the braking system?

II. Translate the following terms into Chinese:

1. sedan
2. convertible
3. pick-up
4. commercial vehicle
5. bus
6. coach

III. Identify the following trademarks and write the company's name under each trademark:



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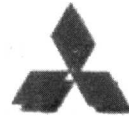
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TEXT B

Automobile's History

Overview

Although such attempts were done before consider that one of the first auto was created by Karl Friedrich Benz who was a German automobile engineer. It was a single-cylinder, water-cooled, 958cm^3 , 0.75hp (560W) unit, but the whole three-wheeled vehicle, and it was first driven through Mannheim in 1885 by his wife Bertha Benz. Simultaneously Gottlieb Daimler and Wilhelm Maybach in Stuttgart made the motorized vehicle. They also are known as inventors of the first motor bike.

The chronological scale of automobile history is here (British classification). All vehicles are divided into two large classes; Antique (1885—1979) and Modern (1980-

present). By its part antique autos are subdivided into four groups: Veteran (1885—1904), Brass or Edwardian (1905—1918), Vintage (1919—1930) and Classic (1931—car over 25 years old). These groups also called eras. In addition in Classic era there are two periods: Pre-war (1931—1948) and Post-war (1949—1979). Antique period is the most interesting when every year new technologies were being invented step by step, vehicles were becoming faster, cheaper and safer.

First mass automobiles manufacturing for people began in Veteran era. Up to 1900 there were already car producing companies in France and USA. One of the first companies was Parhard et Levassor, formed in 1889, in France. The company was quickly followed by Peugeot two years later. In the United States in 1893 was founded the Duryea Motor Wagon Company, becoming the first American automobile manufacturing company. Moreover Oldsmobile (dominated in this era), Cadillac, Winton and Ford were largest auto-producers of that time.

Next automobile era is called Brass or Edwardian, during this era, development of automotive technology was rapid, that time appeared lots of small manufacturers and majority of sales shifted from the hobbyist and enthusiast to the average user. That time were founded such companies as Chevrolet and Isuzu. Henry Leyland former head of Cadillac began new Lincoln Motor Company. Lots of inventions were done. Electric ignition and the electric self-starter both were invented by Charles Kettering, for the Cadillac Motor Company. Engineers devised independent suspension, and four-wheel brakes. The most vivid models of this era were Ford Model T, Bugatti Type 13, Maxwell AA Runabout and Mercedes Simplex.

The Vintage era changed appearance of automobiles; the most recognizable features came front engine location, instead of middle engine, closed body types of vehicles. Also multi-valve and overhead cam, V8, V12, and even V16 engines were produced. Cars became much more practical, convenient and comfortable during this period. Car heating was introduced, as was the in-car radio. Instead of ordinary brakes were used hydraulically actuated. Power steering was also an innovation of this era. Cadillac presented crash proof windscreen and gear box synchronizer. Examples that could give imagination of this era are: Austin 7, Bugatti Type 35, Ford Model A and Cadillac V-16.

Started just after American's Great Depression Classic era however ended much later. By the 1930s, most of the technologies used in automobiles had been invented; however it was often reinvented again at a later date and credited to someone else. Power window, front wheel drive, independent suspension, turbocharger and many other innovations had been used in that time. During the Second WW although civil auto pro-