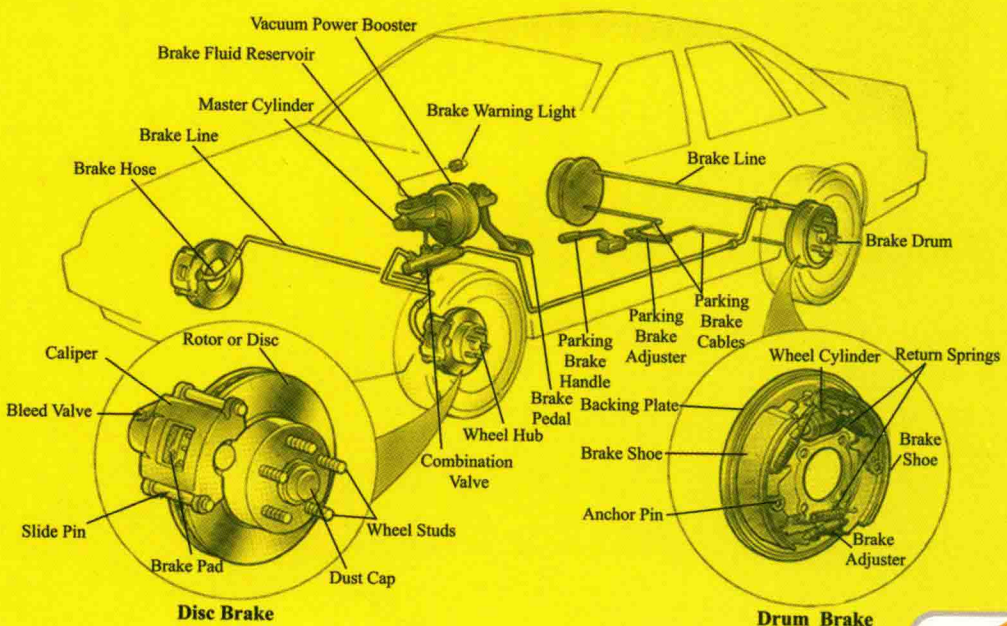
全国高等职业教育专业英语系列规划教材

图解形式　英汉对应
带您快速掌握汽车新技术

Illustrated Professional English of Automotive Industry

汽车专业英语图解教程

高扬　秦晓燕　雷长友　主编



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全国高等职业教育专业英语系列规划教材

汽车专业英语图解教程

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机械工业出版社

本书以汽车构造英语为基础，增加了汽车生产和新能源汽车英语内容。全书主要包括汽车概述、汽车生产，发动机两大机构五大系统、排放控制系统、涡轮增压器，底盘部分汽车传动系统、行驶系统、转向系统、制动系统，汽车电气电子系统，以及纯电动汽车、混合动力汽车、插电式混合动力汽车、燃料电池汽车、自动驾驶汽车等专业英语内容。

本书充分考虑汽车专业英语的特点，以结构图或原理图的“图解”形式，将枯燥的专业英语和形象的汽车结构图结合起来，易学易用。全书共5章，每章主要包括课文、关键词中文翻译、句子翻译示例、思考与练习、实车案例、汽车专业英语词汇特点和翻译。附录提供了每章课文的翻译，供读者学习参考。本书力求体现学以致用的理念，取材精炼，优化组合，理论内容以实用为主，够用为度，以达到理论与实践更好的结合。

本书可供高职高专院校、技师学院、中职技校的汽车类各专业使用，也可供成人高校、函授大学、电视大学相关专业及相关工程技术人员、企业管理人员参考使用。

本书配有电子课件和视频，凡使用本书作为教材的教师均可登录机械工业出版社教育服务网 www. cpmedu. com 下载。咨询电话：010－88379375。

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前　言

Preface

为了适应汽车新技术快速发展，高职院校汽车专业学生不仅要掌握专业知识和技能，更需要掌握汽车专业英语。汽车专业英语已经成为专业技术人员学习和研究国外新技术的必备工具。

高职院校汽车专业英语的教学，主要是培养学生阅读和翻译汽车英文资料的能力。本书根据企业现代化改造、生产一线对应用型高等技术人才在汽车制造与维修技术方面的技能要求，结合汽车新技术的发展趋势，将传统教材内容加以取舍、整合，以汽车构造为主线，将发动机、底盘、电气电子系统与新能源汽车，以及现代汽车制造技术的发展趋势等相关内容有机结合在一起，编成一种全新形式的教材。

本书充分考虑汽车专业英语的特点，以结构图或原理图的“图解”形式，将枯燥的专业英语和形象的汽车结构图结合起来，易学易用。全书共5章，每章主要包括课文、关键词中文翻译、句子翻译示例、思考与练习、实车案例、汽车专业英语词汇特点和翻译。书后提供了每章课文的参考译文，供读者学习参考。全书尽量避免理论过深、专业太强及与实际应用关系不大的内容，符合汽车类相关专业高等职业教育人才培养目标的要求和高等职业教育的特点。本书各章节相对独立，不同专业可根据具体的教学需要进行调整和取舍。

本书由高扬、秦晓燕、雷长友担任主编，李晓蕾、袁立嘉、关皓天参加编写。其中高扬编写第1章、第2章、第5章和附录，雷长友编写第3章，秦晓燕编写第4章，李晓蕾、袁立嘉、关皓天参与了资料的收集整理工作。全书由高扬统稿。在编写过程中曾参考国内外出版的图书资料和权威汽车知识网站，谨向各位编者表示衷心的感谢。感谢在编写过程中提供技术支持的华晨宝马汽车有限公司杜鹏工程师、崔健工程师，上海通用北盛汽车有限公司杨雷工程师。感谢机械工业出版社杨晓昱老师和各位编辑同志的辛勤工作。由于编者水平有限，书中难免存在不妥之处，敬请广大读者批评指正，以便改进和提高。

编　者

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Automobile Overview

基本要求

1. 掌握汽车的基本组成的英文表达。
2. 掌握汽车生产的四大工艺的英文表达。

重点和难点

1. 翻译汽车发动机、底盘、车身和电气系统的简要英文描述。
2. 翻译汽车生产的冲压、焊接、涂装和总装四大工艺的英文描述。

导入新课

Few inventions in modern times have had as much impact on human life and on the global environment as the automobile. Automobiles and trucks have had a strong influence on the history, economy, and social life of much of the world. How much do you know about automobiles?

1.1 Structure of an Automobile

Automobile, byname auto, also called motorcar or car, a usually four-wheeled vehicle designed primarily for passenger **transportation** and commonly **propelled** by an internal-combustion **engine** using a **volatile fuel**. The modern automobile is a complex technical system employing **subsystems** with specific design functions. The major structure of an automobile (Figure 1-1) are the engine, **chassis**, **body** and the **electrical** system. This will be found in every form of motor **vehicle**.

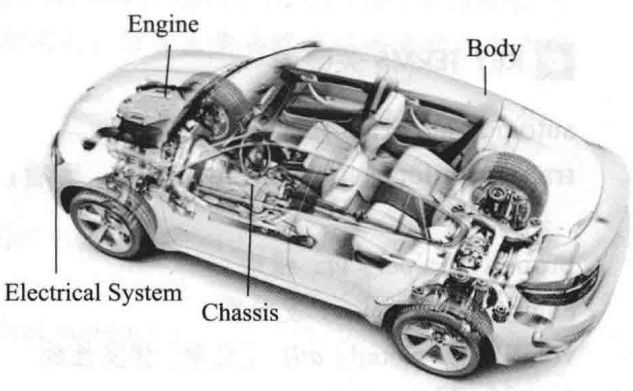


Figure 1-1 Major Structure of an Automobile

Engines

The engine—the "heart" of the automobile—operates on internal combustion, meaning the fuel used for its power is burned inside of the engine. The four-stroke engine is the most common type of automobile engine. The engine is comprised of **pistons**, **cylinders**, tubes to deliver fuel to the cylinders, and other **components**. Each system is necessary for making the automobile run and reducing noise and pollution.

Chassis

The chassis is the **framework** to which the various parts of the automobile are **mounted**. The chassis must be strong enough to bear the weight of the car, yet somewhat **flexible** in order to sustain the shocks and tension caused by turning and road conditions. The chassis is divided into four systems: the transmission system, the running system, the steering system and the braking system.

Body

The body of a car is usually composed of steel or **aluminum**, although **fiberglass** and plastic are also used. While the body forms the passenger **compartment**, offers storage space, and houses the automobile's systems, it has other important functions as well. In most instances, its solid structure protects passengers from the force of an accident. Other parts of the car, such as the front and hood, are designed to **crumple** easily, thereby absorbing much of the impact of a **crash**.

Electrical Systems

Electricity is used for many parts of the car, from the **headlights** to the radio, but its chief function is to provide the electrical **spark** needed to ignite the fuel in the cylinders. The electrical system is comprised of a **battery**, starter, **alternator**, **distributor**, ignition **coil**, and ignition **switch**.

KEY TERMS 关键词

automobile ['ɔ:təməbi:l] *n*. 汽车
transportation [ˌtrænspɔ:'teɪʃn] *n*. 运输；交通
propel [prə'pel] *vt*. 推动
engine ['endʒɪn] *n*. 发动机
volatile ['vɒlətaɪl] *adj*. [化学] 挥发性的
fuel [fjʊəl] *n*. 燃料
subsystem ['sʌb'sɪstəm] *n*. 子系统
chassis ['ʃæsi] *n*. (*pl*. chassis) 底盘
body ['bɒdi] *n*. 车身
electrical [ɪ'lektrɪkl] *adj*. 有关电的，电气科学的
vehicle ['vi:ɪkl] *n*. 车辆；交通工具
piston ['pɪstən] *n*. 活塞
cylinder ['sɪlɪndə(r)] *n*. 气缸
component [kəm'pəʊnənt] *n*. (机器、系统等的) 零件
framework ['freɪmwɜ:k] *n*. 框架，结构

mount [maʊnt] *v*. 安装
flexible ['fleksəbl] *adj*. 灵活的；柔韧的
wheel [wi:l] *n*. 车轮
steering ['stɪərɪŋ] *n*. 操纵，转向
brake [breɪk] *n*. 制动器 *vi*. 刹车
suspension [sə'spenʃn] *n*. 悬架
aluminum [əlju:mɪnəm] *n*. 铝
fiberglass ['faɪbəglɑ:s] *n*. 玻璃纤维；玻璃丝
compartment [kəm'pɑ:tmənt] *n*. 车厢
crumple ['krʌmpl] *vi*. 皱缩；被扭弯
crash [kræʃ] *n*. 撞碎
headlight ['hedlaɪt] *n*. 车头灯；前大灯
spark [spɑ:k] *n*. 火花
battery ['bætəri] *n*. [电] 电池，蓄电池
alternator ['ɔ:ltəneɪtə(r)] *n*. （尤指汽车上的）交流发电机
distributor [dɪ'strɪbjətə(r)]（发动机的）分电器
coil [kɔɪl] *n*. 线圈
switch [swɪtʃ] *n*. 开关

SENTENCES 翻译示例

❶ The major systems of an automobile are the engine, chassis, body and the electrical system.
汽车的主要结构是发动机、底盘、车身和电气系统。

❷ The engine is comprised of pistons, cylinders, tubes to deliver fuel to the cylinders, and other components.
发动机由活塞、气缸、输送燃料至气缸的管道和其他部件组成。

❸ The chassis must be strong enough to bear the weight of the car, yet somewhat flexible in order to sustain the shocks and tension caused by turning and road conditions.
底盘必须足够坚固，以承受汽车的重量，但为了承受转弯和路况所带来的冲击和张力，也得有一定的灵活性。

❹ In most instances, its solid structure protects passengers from the force of an accident.
在大多数情况下，它的坚固结构可以保护乘客免受事故的伤害。

❺ Electricity is used for many parts of the car, from the headlights to the radio, but its chief function is to provide the electrical spark needed to ignite the fuel in the cylinders.
电力用于汽车的许多地方，从车灯到收音机都用电，但其主要功能是提供点燃气缸内燃料所需的电火花。

ASIGNMENTS 思考与练习

1. List the major structure of an automobile.
2. What's the function of the chassis?
3. What is the chief function of the electrical system?

1.2 Car Production

Car production is a complex process consisting of step-by-step creation of a new car.

Before leaving the assembly line, a car will pass through five main processes as follows.

The Press Shop (Figure 1-2)

It's here that steel is shaped and moulded to form the panels that will become a bare bodyshell.

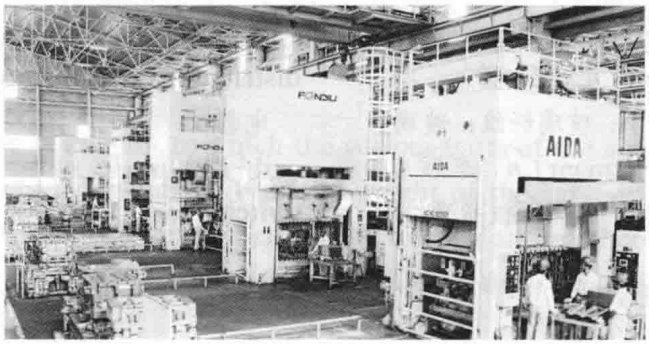


Figure 1-2 The Press Shop

The first step in the production process is to prepare the raw steel that will be used to make our vehicles. Sheet steel arrives in rolls before it is chopped and formed to make the individual components that will be welded together to make each car.

Before the steel is shaped, it has to be prepared. Each steel roll is delivered to a machine that unrolls the coil and smoothes the metal so it is perfectly flat. The metal is then cut into sheets and stamped into the individual panels that make up the car's basic structure. The finished panels are gathered into racks, where they are passed in sequence to the welding shop.

The Welding Shop (Figure 1-3)

In the welding shop, pressed panels are welded together to create a bodyshell. Each bodyshell is given an identity tag that will remain with it right the way through the production process. Created by the production system, this tag determines the car's colour, engine specification, trim, etc.

In its simplest form, the welding shop can be divided into two — the welding stations staffed by skilled people, and those powered by machines. Both stations bring together thousands of individual steel components to create a new bodyshell.

Figure 1-3 The Welding Shop

Components are built up into sub-assemblies, which are brought together to create a car. At the end of the bodyshell line the bonnet and boot are attached to the car by hand. The team here also

makes a final visual inspection, ensuring that the bodywork is perfectly joined and that the panels are smooth without dents, abrasives or other deformations that could create a finishing problem when undergoing the painting process. From here they are lifted onto a conveyor that takes it into the paint shop.

The Paint Shop (Figure 1-4)

When it comes to cleanliness, the paint shop leaves nothing to chance. Maintaining a spotlessly clean, dust-free environment is critical to the quality and consistency of each car's paint job. Now, in order to make the quality standard for line-off, there are four layers in painting including: ED, Sealer & PVC, Primer and Topcoat (gloss and color).

Surface pretreatment: After leaving the welding shop, the surface of the body will be cleaned to increase the anti-rust property and adhesion of the ED step.

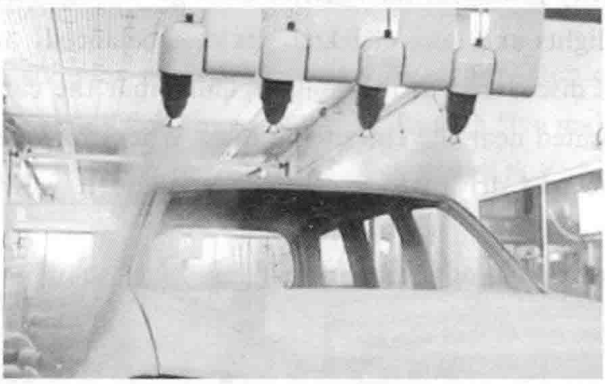


Figure 1-4 The Paint Shop

ED: After the surface pretreatment step, the body will be embedded in the ED paint tank (Electrophoretic Painting Process — E coat). This process is also known as electrodeposition to make a better painting on the surface. After being taken out of the ED paint tank, the body would be dried in an oven to a high temperature for drying the paint and created the hardness of the coating.

Sealer & PVC: This step helps seal the edges of steel, against the external impacts during driving (waterproof and antinoise).

Primer: It increases the adhesion of the topcoat as well as the gloss and color. After the primer layer, the body will be in the drying process with high temperature.

Topcoat: It is the painting layer that creates the beauty for vehicles and shows a true color of the vehicle. Therefore, its requirements are included in three words "gloss, durability and reality." The color will be sprayed onto the primer layer by electrostatic painting process. After that, body will be dried in an oven to a high temperature for drying the surface.

Upon completion, the full body will be checked with a fine finish before moving to the assembly shop.

The Assembly Shop (Figure 1-5)

As soon as the bodyshell arrives in the assembly shop, the doors are removed and sent to another line to have their trim, glass, speakers and mirrors installed. The body, meanwhile, has covers laid in strategic locations to protect the paintwork and components from potential damage.

Because assembly is so complex, the whole task is divided into several parts: the trim line, the power train line and the final line.

Inspection (Figure 1-6)

It was the final step in the production process before delivery to dealers. In order to ensure the highest quality products, all vehicles must go through the final check where its engine is audited, its lights and horn checked, its tires balanced, and its charging system examined. Any defects discovered at this stage require that the car be taken to a central repair area, usually located near the end of the line. When the vehicle passes final audit, it is given a certificate and driven to a staging lot where it will await shipment to its destination.

Figure 1-5 The Assembly Shop

Figure 1-6 Inspection

In a few hours, it has been transformed from a sheet of bare metal to a high-quality car.

KEY TERMS 关键词

steel [sti:l] *n*. 钢铁
mould [məuld] *vt*. 浇铸
panel ['pænl] *n*. 板；平板
bodyshell ['bɒdɪʃel] *n*. 车架；车身外壳
stamp [stæmp] *vt*. (用机器或工具)冲压制成
rack [ræk] *n*. 架子
identity tag 识别标志；身份标签
trim [trɪm] *n*. 装饰；内饰
bonnet ['bɒnɪt] *n*. 发动机罩；发动机盖
boot [bu:t] *n*. (汽车后部的) 行李箱
dent [dent] *n*. 压痕，凹陷
abrasive [ə'breɪsɪv] *n*. 研磨料

deformation [ˌdi:fɔ:'meɪʃn] *n*. 变形
conveyor [kən'veɪə] *n*. 传送机；传送带
anti-rust *adj*. 防锈的
adhesion [əd'hi:ʒn] *n*. 附着力
electrophoretic [ɪˌlektrəfə'retɪk] *adj*. 电泳的
electrodeposition [i'lektrəuˌdepə'ziʃən] *n*. [化学] 电沉积；电镀
oven ['ʌvn] 烘箱，烤箱
gloss [glɒs] *n*. 光泽度；光泽
primer ['praɪmə(r)] *n*. 底漆
durability [ˌdjʊərə'bɪləti] *n*. 耐用度；持久性
horn [hɔ:n] *n*. 喇叭
tire [taɪə(r)] *n*. 轮胎
defect ['di:fekt] *n*. 缺点，缺陷
a staging lot 临时位置
press shop 冲压车间
welding shop 焊接车间
paint shop 涂装车间
assembly shop 装配车间；总装车间

SENTENCES 翻译示例

❶ Car production is a complex process consisting of step-by-step creation of a new car. Before leaving the assembly line, a car will pass through five main processes as follows.
汽车生产是逐步地创造一辆新车的复杂过程。在离开装配线之前，一辆汽车将通过以下五个主要工序。

❷ It's here that steel is shaped and moulded to form the panels that will become a bare bodyshell.
在这里，钢被塑造成型，形成即将成为车身外壳的面板。

❸ In the welding shop, pressed panels are welded together to create a bodyshell.
在焊接车间，冲压后的钢板被焊接在一起，形成一个车身外壳。

❹ Surface pretreatment: After leaving the welding shop, the surface of the body will be cleaned to increase the anti-rust and adhesion of the ED step.
表面预处理：离开焊接车间后，将清洗车身表面，以增加电泳涂装步骤的防锈和附着力。

❺ As soon as the bodyshell arrives in the assembly shop, the doors are removed and sent to another line to have their trim, glass, speakers and mirrors installed.
当车身外壳到达装配车间后，车门就会被拆卸，并被送到另一条线上，以便安装其饰板、玻璃、扬声器和车镜。

ASIGNMENTS 思考与练习

1. What are the four processes of automobile manufacturing?
2. How many layers in painting? What are they?
3. Name out the three parts of the assembly task.

Case Study 实车案例

Production Process of BMW i8　宝马 i8 的生产流程

Innovative manufacturing technologies and the application of new materials characterize the production process for BMW i cars. Their production stands at the beginning of a value chain that is completely aligned with sustainability criteria. From the raw materials production to the energy-efficient vehicle operations and the recycling as the last step, the chosen approach makes a considerable contribution to the favorable overall life cycle assessment of the plug-in hybrid sports car BMW i8. In both the development and the production of the BMW i8, the outstanding technological expertise of the BMW Group comes to the fore.

The BMW Group's global lead in automotive engineering is demonstrated, among other things, in the industrial production of components made of carbon fiber reinforced plastics (CFRP). The development and production of both the combustion engine and the electric motor of the hybrid sports car are also carried out completely by the BMW Group.

The innovative vehicle architecture of the BMW i8 comprises two elements: the Life module, the passenger cell made of carbon fiber reinforced plastic (CFRP), and the aluminum Drive module, which incorporates the entire drivetrain and chassis technology. The Life Drive concept and use of CFRP allows production times to be cut by half compared to those required for an equivalent car built along conventional lines. The process is less investment intensive as the high costs required for a conventional press shop and paint shop are no longer an issue and the Life and Drive modules can be manufactured alongside one another.

The BMW i production network comprises a plant in Moses Lake, Washington State, for the carbon fiber production and a plant in Wackersdorf for the processing into carbon fiber laminates. Both these facilities are operated by SGL Automotive Carbon Fibers (ACF), a joint venture set up by the BMW Group and the SGL Group. They are joined by the BMW Group's own plants in Dingolfing, Landshut and Leipzig.

汽车专业英语词汇特点和翻译

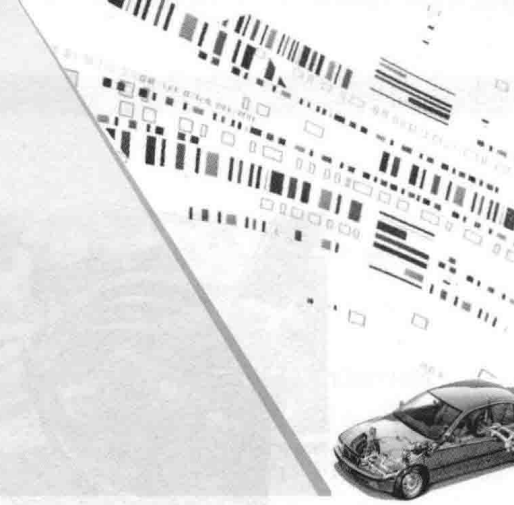
汽车专业英语中涉及大量的汽车专业词汇和术语，具有汽车专业领域里特定的含义，有的词汇甚至仅在汽车领域里使用。另外，有大量非专业词汇，它们虽然不具有专业性，但是在翻译中也呈现出不同的特点。

1. 纯专业词汇

在汽车专业英语词汇中，有的是纯专业词汇，属于机械领域所特有。如：engine（发动机），chassis（底盘），crankshaft（曲轴），generator（发电机），clutch（离合器），suspension（悬架）等，它们的特点是含义精确明晰，概念单一狭窄，在中英文中都有确定的名称。

2. 通用型词汇

有的专业词汇属于通用型词汇，广泛应用于不同专业，而且在不同专业中往往意义不同。如，power 一词，作为一般词汇是指“力量”“权力”“势力”等等，但是在数学中，它是指“幂”，在物理学中，它具有“电”“电源”“功率”等多种含义。这一类词汇的特点是一词多义，用法灵活，应用领域广泛，必须慎重翻译。又如 spring 一词，一般指“春季”“泉源”，机械英语里指“弹簧”“发条”。



Chapter 2

Engines

基本要求

1. 掌握汽车发动机基本构造的英文表达。
2. 翻译汽车发动机的工作过程的英文表达。

重点和难点

1. 翻译汽车曲柄连杆机构和配气机构的英文描述。
2. 翻译汽车燃油供给系统的英文描述。
3. 翻译汽车润滑系统的英文描述。
4. 翻译汽车冷却系统的英文描述。
5. 翻译汽车点火系统的英文描述。
6. 翻译汽车起动系统的英文描述。
7. 翻译汽车排放控制系统的英文描述。
8. 翻译汽车涡轮增压器的英文描述。

导入新课

Have you ever opened the hood of your car and wondered what was going on in there? A car engine can look like a big confusing jumble of metal, tubes and wires to the uninitiated. You might want to know what's going on simply out of curiosity. Or perhaps you are buying a new car, and you hear things like "3.0 liter V-6" and "dual overhead cams" and "tuned port fuel injection". What does all of that mean?

2.1 Car Engines Introduction

The purpose of a **gasoline** car engine is to convert gasoline into motion so that your car can move. Currently the easiest way to create motion from gasoline is to burn the gasoline inside an engine. Therefore, a car engine (Figure 2-1) is an **internal combustion engine**—combustion takes place internally.