高职高专示范专业课程改革规划教材

汽车专业英语实用教程

甘辉 编著

机械工业出版社
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甘　辉　编著
郑颖杰　主审

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本书针对与汽车相关的汽车运用、汽车电子、汽车装配、汽车整形、汽车保险和汽车营销等专业，分为五大模块，即5章28个单元。第1章为基本知识，共12个单元，涉及汽车相关专业必须掌握的汽车基本结构和原理；第2章为汽车先进技术，共4个单元；第3章为汽车检测设备与维修技术，共4个单元；第4章为汽车保险知识，共4个单元；第5章为汽车营销，共4个单元。每个单元包括课文、词汇、注解、习题、阅读实践训练等多个环节，并有针对性地介绍了一些科技英语语法知识，书后附有本书所涉及的汽车专业词汇中英文对照表。

本书注重遵循“学用结合”的原则，形式上力求创新，条理清晰、通俗易懂、实用性强、内容全面，使之能真正反映当代汽车领域发展的前沿技术和最新动态，帮助学生较系统地学习汽车专业知识，熟练掌握汽车专业英语词汇，能够阅读和翻译一般的汽车英语使用说明书和有关技术资料。

本书既可作为高职高专院校汽车类专业的专业英语教材，也可作为相关企业人员培训用书或相关技术人员自学参考书。

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前　言

本书根据教育部高职高专技能型人才培养模式要求，结合汽车专业实际需要和教学经验编写而成，旨在使学生熟悉本专业的英语词汇及用法，了解汽车领域科技文章结构及体裁，培养学生英语阅读能力和翻译能力，以便更好地直接从国外资料中获取先进的汽车科技信息和知识。

针对汽车相关专业，本教材兼顾了汽车运用专业、汽车电工电子专业、汽车制造技术专业、汽车整形技术专业对各部件组成、结构和原理以及较先进的技术资料的要求，同时兼顾了汽车营销专业、汽车公估与保险实务专业既要求有结构和原理知识又需要相关的营销和保险知识的需要。考虑到课时限制，本教材篇章力求精而专，在章节选用上采用“基础章节＋专业针对性章节”，以求其适应面更广。“汽车基础知识篇”适用于所有相关专业的基础教学，“汽车营销知识篇”适用于汽车营销专业，“汽车保险与公估篇”适用于汽车保险与公估专业，“先进汽车技术篇”为汽车运用专业、汽车电工电子专业、汽车制造技术专业、汽车整形技术专业和其他专业的拓展内容。在每章前均提出“学习目标”、“知识目标”，采用大量的图形和照片来配合讲解各部件组成、结构和原理，展示当前的设备、零部件和系统。在每章中提出问题，结合学习情境让学生思考，要求结合汽车实物，熟悉各部件组成、结构和原理，并给出模拟场景、实物图片等，让学生学会实际运用。

本书由湖南交通职业技术学院甘辉副教授任主编，湖南交通职业技术学院沈钡老师参与编写了第五章。全书由湖南交通职业技术学院郑颖杰副教授主审。

本书在编写中参阅了国内外有关科技文献资料，得到了沈锦、仇雅莉两位副教授的帮助和指导，在此一并表示衷心感谢！

由于编者水平有限，书中难免存在不妥之处，敬请读者不吝赐教。

编　者

Contents

Chapter 1 Automobile Fundamentals

Unit 1 The Automobile

Text

学习目标

知识目标：

1. 掌握与汽车结构、分类、运行原理等相关的专业术语、单词和词汇。
2. 掌握汽车主要结构的英文表达方法。
3. 掌握科技英语的特点。

能力目标：

1. 能对汽车整体构造的各大总成进行中英互译。
2. 能进行与汽车大体构造相关的英语资料的阅读和翻译。
3. 能在汽车实物上标识出相应结构的英语单词或词汇。

情境描述：（***Suppose you become an expositor in an exhibition of automobile, you are needed to introduce some knowledge about automobile, such as classifications, operating principle and automotive basic mechanics. Two roles of each team are needed: A expositor and a visitor. Practice then act out.***）

Let's think, if you visit an exhibition of automobile, there are many automobile before you, and you have to introduce them, but you don't know how to describe some of the words or phrases, what must you make preparation for?

The modern automobile, as you know, evolved from the horse-drawn carriage which was gradually replaced in the early part of last century early automobiles even looked like carriages. As the automobile made a place for itself in our daily lives, it also became more and more expensive to purchase, use, and maintain. Automobile expenses now account for a substantial portion of most family budgets. In fact, one out of every four retail sales dollars goes for an automotive-related purchase. Knowledge of the automobile is equally important for anyone considering employment in the automotive purchase.

Structurally, the automobile is composed of four basic sections such as engine, chassis, body and electrical system(Fig. 1-1). In other words, the automotive basic mechanics is subdivided into several major categories: the body and frame, the engine or power source, the drive lines, running gear and the suspension system(Fig. 1-2).

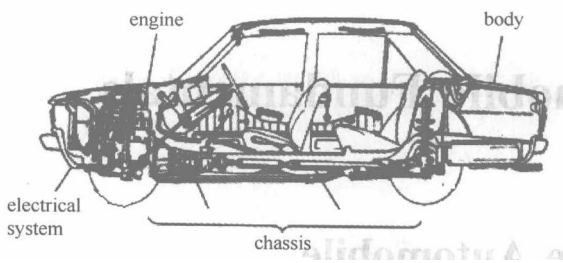

Fig. 1-1 Layout of a modern automobile

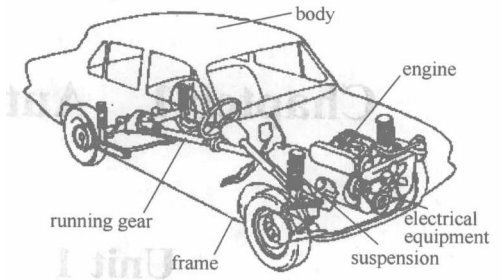

Fig. 1-2 Major parts of a car

The engine, which is sometimes called powerplant, is a machine that converts heat energy into mechanical energy. The engine makes the car go by using the explosive power of a mixture of air and fuel. Generally, an automobile is operated by internal combustion engine. The automobile engines can be classified according to different aspects, and the engine system that enable the engine to start and continue to operate are as follows: starting system, fuel system, ignition system, cooling system, lubricating system, exhaust system, charging system, engine's electronic control system, the emission(or pollution)control system. These are the system for petrol engines. Diesel engines have similar system except for the fuel and ignition systems. Some parts of the systems are built into the engine, some parts are attached to the engine and other parts are located on the body panels in the engine compartment.

The body and frame section of the automobile is the basic foundation of the vehicle. All other components and systems are attached to the body and frame. There are two types of body and frame configurations. One type is the separate body and frame construction which has been used for a long time. The second type is the unitized one with the body and frame in one unit which is used in most cars today. The body is made from rolled sheet steel and designed to provide the automotive total rigidity in bending and torsion. In the case of collision, it is intended to resist and minimize intrusions into the passenger space. These sections can further fall into a lot of assemblies and parts, such as the hood, trunk lid, the fenders, the roof panels, the door, the dashboard, windows, windshield wipers, grille, the bumpers and the luggage compartment. Automobile external structure is as follows(Fig. 1-3).

The frame, or underbody, is the main part of the chassis, on which the most parts of the chassis are mounted. It also provides the support for the engine, body and transmission members. Its function is to enhance the body strength and stiffness, both in bending and torsion. In the case of collision, the frame is forced to crush and absorb a large portion of the energy of impart. Frames are made of channel or U-shaped sections steel, welded or riveted together. When the engine, wheel, power train(Fig. 1-4), brakes, and steering system are installed on the frame, the assembly is then called the chassis.

The chassis is a framework used to assemble auto components on it. The chassis itself is divided into four systems like transmission system(drive train), running gear/going system, steering system, and brake system. A large number of designs in pressed-steel frame form a skeleton on which the engine, wheel, axle assemblies, transmission, steering mechanism, brakes, and sus-

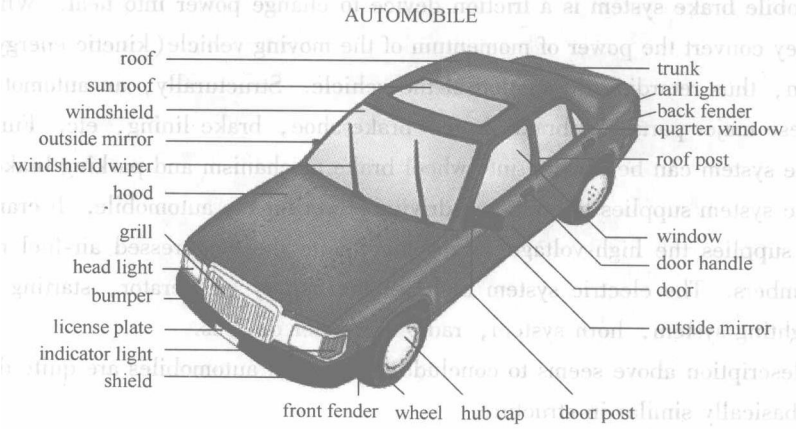

Fig. 1-3 Automobile

pension members are mounted.

The transmission system applies to the components needed to transfer the drive from the engine to the road wheels. The main components are clutch, gearbox, universal driving device/universal gearing, final drive, differential and axle shaft.

The running gear includes frame, axles, wheels and suspension. The primary purpose of the suspension system is to increase strength and durability of components and to meet customer's requirement for riding comfort and driving safety. The suspension system absorbers road shocks as the vehicle travels over rough roads and holds the tire and wheel in correct alignment with the car and the road. It also allows the tires and wheels to move up and down relative to the body over bumps and chuckholes. The major component is springs, shock absorbers, struts, torsion bars, axles, and connecting linkages.

The function of the steering system(Fig. 1-5) is to provide the driver with a means for controlling the direction of the vehicle as it moves. The steering system consists of steering wheel, steering shaft, worm, gear sector, pitman arm, drag link, steering knuckle arm, kingpin, steering arms, tie rod, front axle and steering knuckle. They enable the car to change the direction by means of turning and moving forth and back.

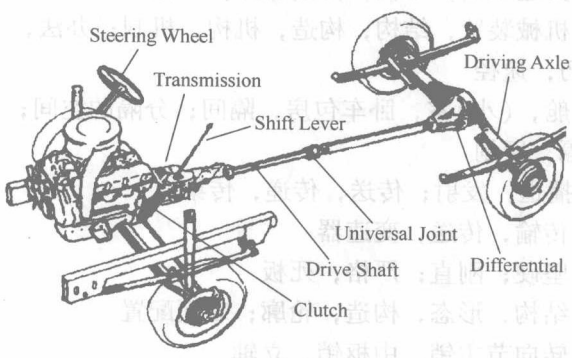

Fig. 1-4 Power train

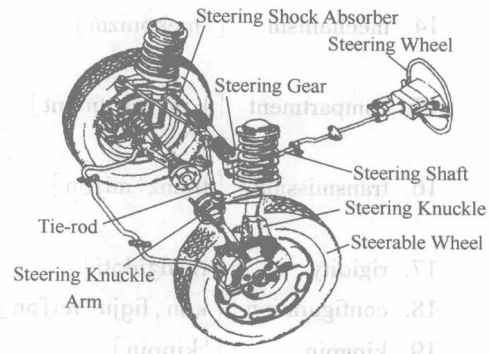

Fig. 1-5 The steering system

The automobile brake system is a friction device to change power into heat. When the brakes are applied, they convert the power of momentum of the moving vehicle(kinetic energy)into heat by means of friction, thus retarding the motion of the vehicle. Structurally, an automotive brake system contains these major parts like brake drum, brake shoe, brake lining, etc. Functionally, an automotive brake system can be divided into wheel brake mechanism and parking brake mechanism.

The electric system supplies lighting and driving power for the automobile. It cranks the engine for starting. It supplies the high-voltage surges that ignite the compressed air-fuel mixture in the combustion chambers. The electric system includes the battery, generator, starting system, ignition system, lighting system, horn system, radio and other devices.

The auto description above seems to conclude that though automobiles are quite different in design, they are basically similar in structure.

New Words

1. automobile	['ɔːtəməubiːl]	*n.* 汽车
2. mechanic	[mi'kæniks]	*n.* 结构；机构；机件，机工；技工；机械地工作的人
3. subdivide	[ˌsʌbdi'vaid]	*v.* 再分，细分
4. combustion	[kəm'bʌstʃən]	*n.* 燃烧，氧化
5. frame	[freim]	*n.* 框架，骨架，构架
6. gear	[giə]	*n.* 齿轮，传动装置，齿轮，传动装置；设备，用齿轮使联动；(在……)搭上齿轮，使啮合 *vi.* 换档 *v. & vi.* (使)搭配，(使)适合【(+to/for)】
7. suspension	[sə'spenʃən]	*n.* 悬架，悬吊；悬置；悬浮；暂停
8. chassis	['ʃæsi]	*n.* 底盘，底架，底板【座】，飞机机架
9. classify	['klæsifai]	*v.* 分类，分等，归类
10. substantial	[səb'stænʃəl]	*adj.* 实质上的，有内容的，物质的
11. ignition	[ig'niʃn]	*n.* 点火；点燃
12. petrol	['petrəl]	*n.* 汽油
13. vehicle	[viːikl]	*n.* 交通工具，车辆；传播媒介，手段
14. mechanism	['mekənizm]	*n.* 机械装置，结构，构造，机构，机制；办法，技巧，途径
15. compartment	[kəm'pɑːtmənt]	*n.* 舱，(小)室，卧车包房，隔间；分隔的空间；间隔，区划
16. transmission	[trænz'miʃən]	*v.* 播送，发射；传送，传递，传染 *n.* 传输，传送，变速器
17. rigidity	[ri'dʒidəti]	*n.* 坚硬；刚直；严格；死板
18. configuration	[kənˌfigju'reiʃən]	*n.* 结构，形态，构造，轮廓；表面配置
19. kingpin	['kiŋpin]	*n.* 转向节主销，中枢销，立轴
20. torsion	['tɔːʃən]	*n.* 扭转；转矩，扭力；扭曲

21. lubricating	['lu:brikeitiŋ]	*adj.* 润滑的
22. automotive	[ˌɔ:tə'məutiv]	*adj.* 汽车的；自动推进的，自动的，机动的
23. assembly	[ə'sembli]	*n.* 装配，组装；总成；与会者；集会；聚集在一起的人；集合
24. hood	[hud]	*n.* 发动机罩，车篷，头巾，兜帽
25. fenders	['fendə(r)]	*n.* 挡泥板，防卫物
26. dashboard	['dæʃˌbɔ:d]	*n.* 汽车的仪表，仪器板
27. windshield	['windʃi:ld]	*n.* (汽车)风窗玻璃
28. grille	[gril]	*n.* 格子，格栅，汽车散热器的护栅，格子窗
29. weld	[weld]	*vt./n.* 焊接；熔接；锻接，使结合；使连成整体
30. rivet	['rivit]	*n.* 铆钉 *vt.* 铆接，把……固定住
31. gearbox	['giəbɔks]	*n.* 齿轮箱，变速器
32. clutch	[klʌtʃ]	*vt.* 抓牢，踩汽车之离合器，孵小鸡
33. sector	['sektə(r)]	*n.* 抓紧，掌握，离合器
		n. 扇形；扇形面；部门；领域；防御地段；防区
34. friction	['frikʃən]	*n.* 摩擦，摩擦力；冲突，不和
35. power-plant		*n.* 发电厂，发电站，动力装置，发动机/站，动力厂
36. pitman	['pitmən]	*n.* 摇杆，【机】连接杆(复数为 pitmans)
37. knuckle	['nʌkəl]	*n.* 指节，关节，万能接头，转向节，铰链
38. momentum	[məu'mentəm]	*n.* 动力，动量；冲力，势头

Phrases and Expressions

1. internal combustion engine	内燃机
2. rolled sheet steel	轧制钢板
3. transmission system(drivetrain)	传动系
4. running gear/going system	行驶系
5. pressed-steel frame	冲压制造的钢车架，压制钢车架
6. universal driving device/universal gearing	万向传动装置
7. axle shaft	半轴，驱动轴，车轴
8. leaf springs	钢板弹簧
9. coil springs	螺旋弹簧
10. torsion bars	扭力杆，扭杆弹簧
11. gear sector	扇形齿轮
12. drag link	转向直拉杆
13. steering knuckle arm	转向节臂
14. worm gear	蜗轮
15. brake drum	制动鼓
16. brake shoe	制动蹄片

17. brake lining 制动摩擦衬片
18. high-voltage surge 高压脉冲
19. trunk lid 行李箱盖
20. in alignment(with…) (与……)成一直线，排列整齐；校准

Notes to the Text

1. The automotive basic mechanics is subdivided into several major categories: the body and frame, the engine or power source, the drive lines, running gear and the suspension system.

汽车基本的构件可进一步细分为许多部分，如车身和车架、发动机或者动力源、行驶系、传动系，以及悬架。

2. The automobile engines can be classified according to different aspects, and the engine system that enable the engine to start and continue to operate are as follows, starting system, fuel system, ignition system, cooling system, lubricating system, exhaust system, charging system, engine's electronic control system, the emission(or pollution)control system.

汽车发动机可从不同的方面进行分类，且发动机系统通过下面这些系统可使发动机起动并运转起来：起动系、燃料供给系、点火系、冷却系、润滑系、排气系统、进气系统、发动机电控系统和排放控制系统。

3. Its function is to enhance the body strength and stiffness, both in bending and torsion. In the case of collision, the frame is forced to crush and absorb a large portion of the energy of impart.

车架的作用是加强车身的弯曲和扭转方面的强度和刚度。万一发生碰撞，车架被压缩变形，吸收了大部分碰撞力。

4. Frames are made of channel, or U-shaped, sections, welded or riveted together. When the engine, wheel, power train, brakes, and steering system are installed on the frame, the assembly is then called the chassis.

车架由槽型或U形截面钢(槽钢)焊接或铆接而成。发动机、车轮、制动系、转向系被安装在车架上，装配总成就叫做底盘。

5. The suspension system absorbers road shocks as the vehicle travels over rough roads and holds the tire and wheel in correct alignment with the car and the road. It also allows the tires and wheels to move up and down relative to the body over bumps and chuckholes.

当汽车行驶在不平的路面时，悬架系统吸收路面的振动，使轮胎和车轮与汽车和路面之间有确定的运动关系，同时在颠簸时悬架系统让车轮相对车身上下运动。

6. The steering system consists of steering wheel, steering shaft, worm, gear sector, pitman arm, drag link, steering knuckle arm, kingpin, steering arms, tie rod, front axle and steering knuckle.

转向系统包括转向盘、转向轴、蜗杆、扇形齿轮、转向摇臂、直拉杆、转向节臂、主销、转向臂、转向横拉杆、前轴和转向节。

After class, let's try:

Can you try to make labels for the components and parts of the automobile like below?

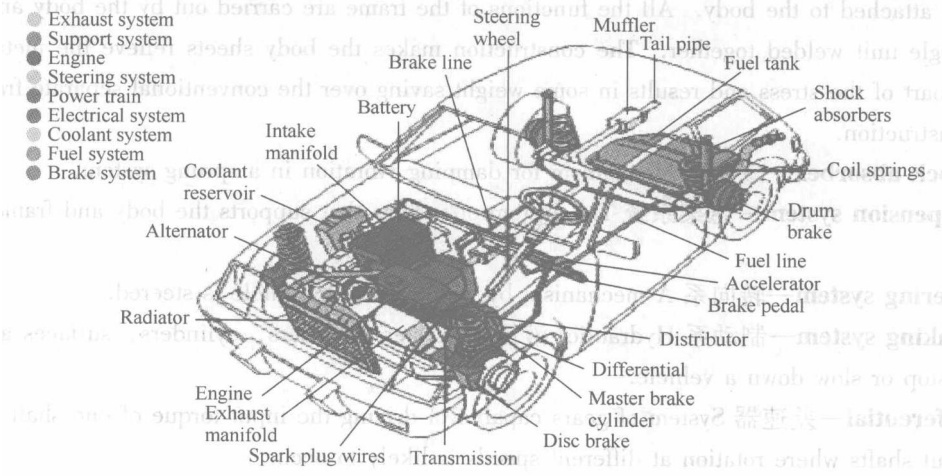

Fig. 1-6

Let's try to look for:

Can you try to look for the note to the components and parts of the automobile in the labels like below?

Frame—车架 The platform or foundation of the automobile to which the body, engine and running gear are attached.

Body—车身 The structure of the car that encloses the driver, passengers, engine compartment and trunk.

Fender—翼子板 Any fixed side-parcel of a vehicle that partially shrouds a road wheel.

Hood—发动机罩 Hinged or removable body panel by which access is gained to the engine compartment of a vehicle.

Trunk lid —行李箱盖 The entire back of the vehicle lifts up(using a liftgate or hatch).

Dashboard—仪表板 Interior panel beneath the windscreen or windshield, on which instruments are mounted.

Windshield wiper—刮水器 Oscillating blade, with flexible rubber blade, for- cleaning and removing water from a windshield or windscreen.

Grille—格栅 Decorative and protective grid at front of vehicle.

Bumper—保险杠 Horizontal bar mounted at front and rear of vehicle to prevent or reduce damage in low-speed impacts, and to absorb impact energy.

Engine—发动机 The main power unit of a vehicle, converting the energy of a liquid or gas fuel into mechanical energy.

Drivetrain—传动系 The path through which power flows from the engine to the drive wheels.

Transmission—变速器 A gearbox used to multiply torque (转矩,扭力)and allow various vehicle speeds while keeping the engine speed within its designed rpm range.

Chassis—底盘 Structural lower part of a vehicle to which the running gears and body is attached. The true chassis is now evident only in heavy goods vehicles, some public service vehicles, and some specialist cars.

Unitized body—整体式车身 A body type construction that there is no frame and all assembly

units are attached to the body. All the functions of the frame are carried out by the body and frame are a single unit welded together. The construction makes the body sheets relieve the metal frame work of part of the stress and results in some weight saving over the conventional separate frame and body construction.

Shock absorber—减振器 Mechanism for damping vibration in a sprung system.

Suspension system—悬架系统 The system of springs that supports the body and frame on the wheels.

Steering system—转向系 A mechanism by which a motor vehicle is steered.

Braking system—制动系 Hydraulic(液压的)system of levers, cylinders, surfaces and fluid used to stop or slow down a vehicle.

Differential—差速器 System of gears capable of driving the input torque of one shaft between two output shafts where rotation at different speeds is likely to occur.

Check Your Understanding

Ⅰ. Questions about the text:

1. Why do we have to learn practical automobile English?
2. What systems enable the engine to start and continue to operate?
3. What does the automobile consist of mainly?
4. What is the function of body and frame?
5. What does the chassis consist of?
6. Could you describe some of the parts of each system on the chassis?

Ⅱ. Choose the best answer from the following choice to match the sentence:

differential	engine	transmission	body	frame
hood	automobile	drivetrain	chassis	gearbox

1. The _____, or underbody, is the main part of the chassis, on which the most parts of the chassis are mounted.
2. The _____which is sometimes called powerplant, is a machine that converts heat energy into mechanical energy.
3. The _____ is a framework used to assemble auto components on it.
4. The _____ system applies to the components needed to transfer the drive from the engine to the road wheels.
5. _____—The structure of the car that encloses the driver, passengers, engine compartment and trunk.
6. _____—Hinged or removable body panel by which access is gained to the engine.
7. Structurally, the _____is composed of four basic sections such as engine, chassis, body and electrical system.
8. _____—an assembly with internal speed changing gears; a transmission.
9. _____—System of gears capable of driving the input torque of one shaft between two out-

put shafts where rotation at different speeds is likely to occur.

10. _____—The path through which power flows from the engine to the drive wheels.

Ⅲ. Translate the following into Chinese:

1. service brake mechanics	2. running gear	3. electric system
4. petrol engine	5. windshield wiper	6. dashboard
7. luggage compartment	8. axle shaft	9. drag link

Ⅳ. Translate the following into English:

1. 驻车制动器	2. 传动系	3. 悬架系统
4. 柴油发动机	5. 转向节	6. 可燃混合气
7. 汽车构件	8. 机械能	9. 内燃机

Ⅴ. Translate the following sentences into English or Chinese:

1. The modern automobile, as you know, evolved from the horse-drawn carriage which was gradually replaced in the early part of last century early automobiles even looked like carriages.

2. When the brakes are applied, they convert the power of momentum of the moving vehicle (kinetic energy) into heat by means of friction, thus retarding the motion of the vehicle.

3. 发动机，有时叫做动力装置，是一种将热能转化为机械能的机器。

4. 汽车底盘是一个用来总装汽车零部件的框架。

Ⅵ. Please give the machines'name in English:

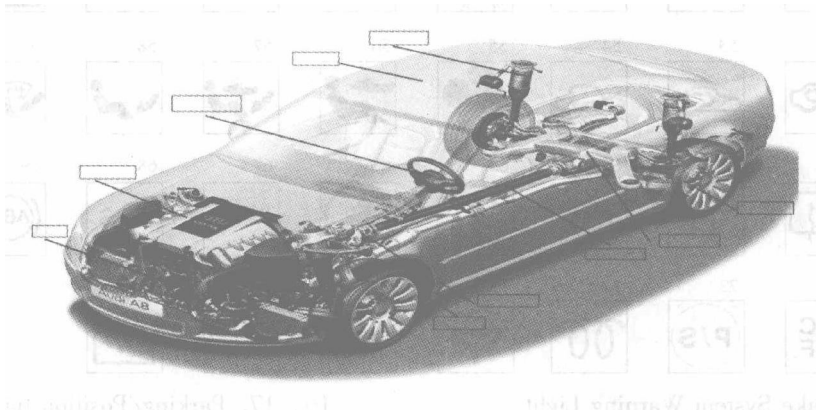

Fig. 1-7

Ⅶ. Training center practice:

1. In a training center, in front of a real automobile, students are required to identify the main parts and tell their corresponding English terms;

2. Students are required to introduce the construction of an automobile by means of indicating the relating parts of the automobile.

Practical Material

Vehicle Symbols

1, 2. Brake System Warning Light
3, 4. Instrument Panel Illumination
5, 6. Front Fog Lamp
7. Fog Warning Lamp
8. Main Headlamp Switch
9. Headlight Low Beam
10. Headlight High Beam Indicator
11. HeadlampWipe/Wash
12. Floodlamp
13. Rotating Beacon
14, 15. Interior Light
16, 17. Parking/Position tight
18. Hazard Warning Flashers
19. Turn Signal and Hazard Warning indicator
20. Heated Mirror
21. Engine Coolant Temperature
22. Charging System Warning
23, 24. Low- Fuel Level Warning
25. Safety Belt Reminder Light
26. Engine Oil Pressure Warning
27. Low Engine Oil Level Warning Light