



系统性强、定位明确。丛书各教材之间联系密切，符合各个学校的课程体系设置，为学生构建了完整、牢固的知识体系。
层次性强。各教材的编写严格按照由浅及深、循序渐进的原则，采用以具体实操项目为单元的项目式编写方法，重点突出。
先进性强。本套教材吸收最新的研究成果和企业的实际案例，使学生对当前专业发展方向有明确的了解。
操作性强。教材重点培养学生的实际操作能力，并最大限度地理论运用于实践中。本系列教材所选案例均来源于企业，以增强学生的实际应用能力，并最大限度地满足企业对汽车类专业应用型人才实际能力的需求，增强学生在就业过程中的竞争力。
以满足广大企业对汽车类专业应用型人才实际能力的需求，增强学生在就业过程中的竞争力。

十二五
汽车类

MIANHANG SHIERWU GAOJING XUEXI
SUHUA JIAOCAI QICHELEI

的学习效果。



面向“十二五”
高等学校规划教材·汽车类

汽车类

汽车 专业英语

主编 孟思聪 姜吉光 王扬
主审 刘金华



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内 容 提 要

本教材内容具有实用性强、与企业实际岗位能力需求紧密结合的特点。本书共分为5部分28个教学单元,全面介绍了学生在今后工作过程中需要的汽车构造、汽车检修以及4S店等方面的英语知识。每单元都围绕一个主题进行选材和编写,各单元的基本内容包括:①课文;②词汇及注解;③短语及注解;④缩略词及注解;⑤练习(针对汽车构造及原理、汽车检测及汽车销售技巧);⑥全篇课文翻译。6块内容详细阐述每个单元的知识点,并通过课文详解,有效地帮助学生理解文章内容。

本书主要供高等学校汽车类专业的学生使用,也可以作为相关企业的培训教材,或供相关技术人员学习参考。

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出版说明

汽车产业是国民经济重要的支柱产业，产业链长、关联度高、就业面广、消费拉动大，在国民经济和社会发展中发挥着重要作用。进入 21 世纪以来，我国汽车产业高速发展，形成了多品种、全系列各类整车和零部件生产及配套体系，产业集中度不断提高，产品技术水平明显提升，已经成为世界汽车生产大国。中国汽车业在产业飞速发展的同时，人才缺口也日益增大。汽车人才的培养不仅仅是为了填补这个缺口，更是中国汽车业的良性发展的需要。

北京理工大学出版社为顺应国家对于培养汽车专业技术人才的要求，满足企业对毕业生的技能需要，以服务教学、面向岗位、面向就业为方向，特邀请一批国内知名专家、学者、优秀学校骨干教师和企业专家编写并审读《面向“十二五”高等学校规划教材·汽车类》系列教材，力求为广大读者搭建一个高质量的学习平台。

本系列教材面向汽车类相关专业。作者结合众多学校学生的学习情况，本着“实用、适用、先进”的编写原则和“通俗、精炼、可操作”的编写风格，以学生就业所需的专业知识和操作技能为着眼点，力求提高学生的实际操作能力，使学生更好地适应社会需求。

一、教材定位

- ✎ 以内容为核心，注重形式的灵活性，使学生易于接受。
- ✎ 以实用、适用、先进为原则，使教材符合汽车类课程体系设置。
- ✎ 以就业为导向，培养学生的实际操作能力，达到学以致用目的。
- ✎ 以提高学生综合素质为基础，充分考虑对学生个人能力的提高。

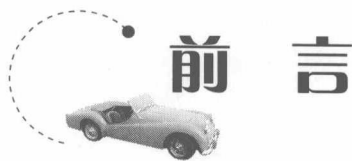
二、丛书特色

- ✎ 系统性强、定位明确。丛书中各教材之间联系密切，符合各个学校的课程体系设置，为学生构建了完整、牢固的知识体系。
- ✎ 层次性强。各教材的编写严格按照由浅及深，循序渐进的原则，采用以

具体实操项目为单元的项目式编写方法，重点、难点突出，以提高学生的学习效率。

- ✚ 先进性强。本套教材吸收最新的研究成果和企业的实际案例，使学生对当前专业发展方向有明确的了解。
- ✚ 操作性强。教材重点培养学生的实际操作能力，并最大限度地将理论运用于实践中。本系列教材所选案例均贴合工作实际，以满足广大企业对汽车类专业应用型人才实际操作能力的需求，增强学生在就业过程中的竞争力。

本套教材适用于汽车维修、检测、营销等专业的高等学校使用，也可供相关专业从业人员参考。



△ 汽车专业英语

近年来,随着汽车产业的迅速发展,国外各大汽车厂商争先抢占中国市场,致使品牌种类繁多、车型年年换,随之而来的使用说明书、维修手册、电脑诊断仪等材料和设备大多为英文版,而没能及时翻译成汉语。尤其是随着现代通信技术的迅猛发展,从网上接触的先进汽车技术信息的 95% 也都用英文来表达。因此,对汽车相关英文知识的缺乏,将会对学生今后从事汽车相关岗位的工作产生非常不利的影响。事实上,汽车英语已逐渐成为汽车相关企业选择人才的一项重要标准。编写本书的目的是为了提高汽车专业学生和汽车从业人员的英语水平,为其能够更好地做好本职工作提供方便。

本书是一本以直观性和通俗性为特点,详细介绍汽车结构、汽车检测以及 4S 店等方面知识的英语教材。全书包括 5 部分,共 28 个单元,每个单元都采用图文并茂的形式,把教学内容直观地展现出来。同时,每篇文章都配有全文翻译、课后习题及答案详解等辅助教学内容,旨在强化学生对整篇文章的理解。本书另一大特点是实用性强、实效性强,教材内容不但包括汽车构造方面的专业英语知识,还广泛涉及包括 CVT 等在内的汽车新技术,以及包括 V. A. G 1552 在内的诊断仪器的使用方法,以便为学生今后就业打下良好基础。

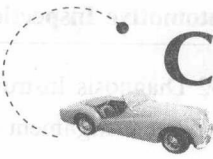
本书可作为高等学校汽车类专业的专业英语教材及参考书,也非常适合从事汽车服务的专业技术人员和汽车爱好者学习参考。

本书由孟思聪、王扬、姜吉光老师主编,由刘金华主审。本书副主编有:朱艳丽、孙丽敏、马天博、吕兵、杨娜、朱宏;编委有:刘春妍、于兆佳、信建杰、刘春波、依志国、金鑫、李红岩、杨健。本书在编写过程中,参考、引用了大量的参考文献,在此,对文献的原作者表示诚挚的谢意!

由于编者水平有限、编写经验不足,本书中的缺点、错误在所难免,恳请广大师生和读者批评指正。

编 者

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汽车专业英语

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1

Chapter One

△ 汽车专业英语

Engine

1.1 Engine Assembly

1.1.1 Engine Classification

Engines can be classified in several methods. In general, engines can be divided into electric motors, steam engines and internal combustion engines. We can also follow other methods to divide engines.

Cylinder Arrangement

Generally, the cylinder arrangements are as follows (See fig. 1.1.1-1 to fig. 1.1.1-3).

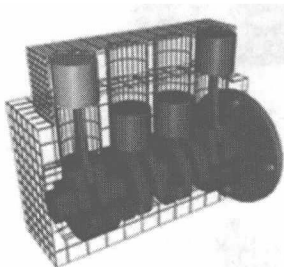


Fig. 1.1.1-1 In-line 4

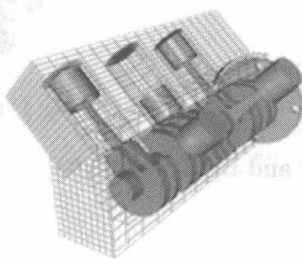


Fig. 1.1.1-2 V6

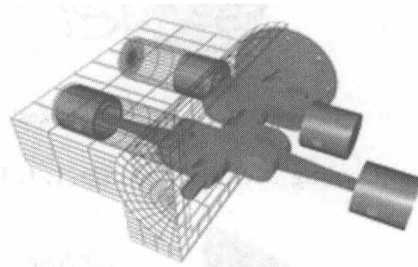


Fig. 1.1.1-3 Flat 4

In Volkswagen designs, new cylinder arrangements of engines are created (See fig. 1.1.1-4).

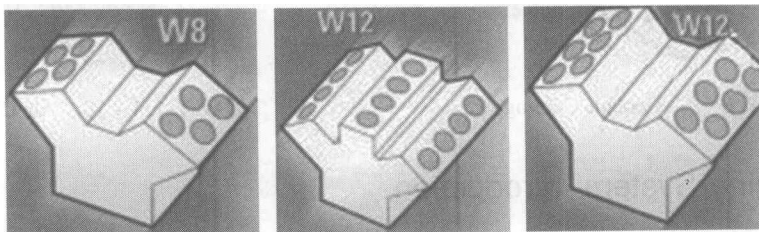


Fig. 1.1.1-4 New Designs in Volkswagen

Fuel Energy Used (See fig. 1.1.1 -5 and fig. 1.1.1 -6)

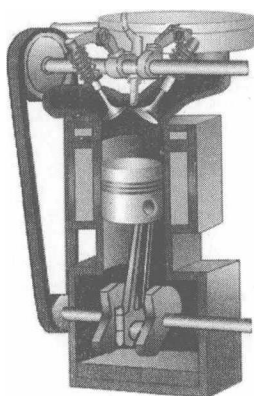


Fig. 1.1.1 -5 Gasoline Engine

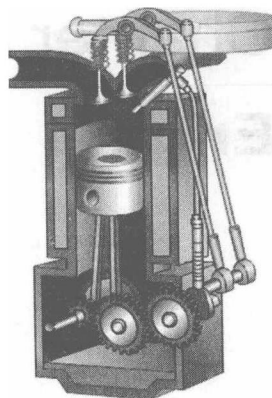


Fig. 1.1.1 -6 Diesel Engine

Operating Stroke (See fig. 1.1.1 -7 and fig. 1.1.1 -8)

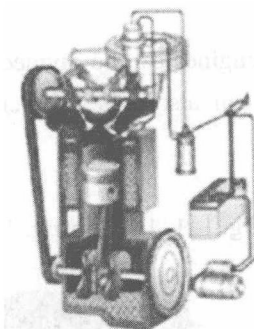


Fig. 1.1.1 -7 Four Strokes

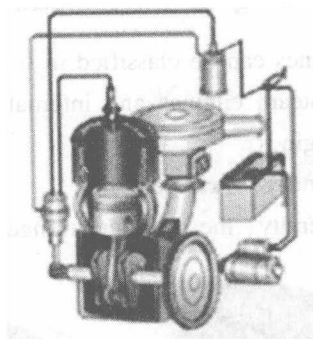


Fig. 1.1.1 -8 Two Strokes

Cooling Method (See fig. 1.1.1 -9 and fig. 1.1.1 -10)

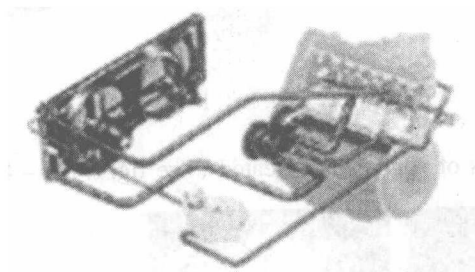


Fig. 1.1.1 -9 Coolant Cooling

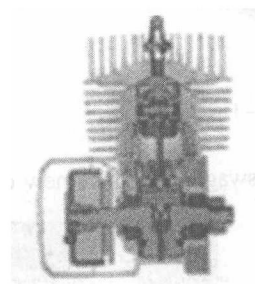


Fig. 1.1.1 -10 Air Cooling

1.1.2 Engine System Introduction

When we are driving our own cars or taking a bus, even other vehicles, we are wondering that such marvelous transportations can send us anywhere we like to go. As we know, the engine

is the heart of a vehicle, and it can produce great power to propel the vehicle. Here is the configuration of an engine (See fig. 1.1.2 – 1 to fig. 1.1.2 – 3).

Generally speaking, an engine contains one engine block, two assemblies and five systems.

One engine block means that this assembly has a cylinder block, one or two cylinder heads (if it is a V type engine) and a crankcase.

Two assemblies mean an engine crankshaft and connecting rod assembly and a valve train.

Five systems mean the fuel supply system, the lubrication system, the cooling system, the ignition system and the starting system.

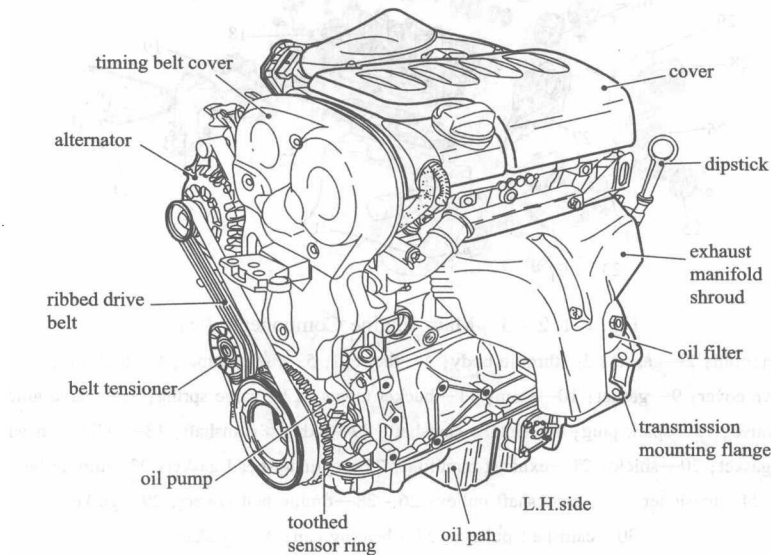


Fig. 1.1.2 – 1 Main Engine Components (a)

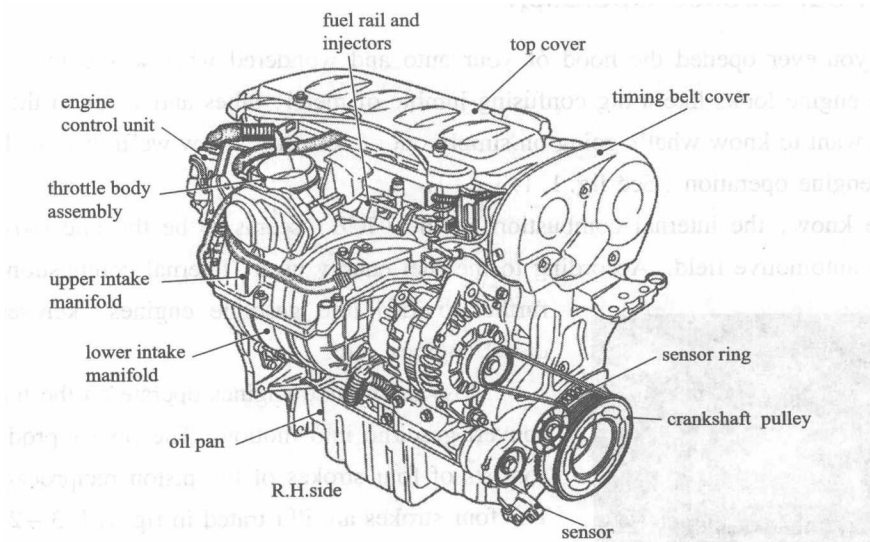


Fig. 1.1.2 – 2 Main Engine Components (b)

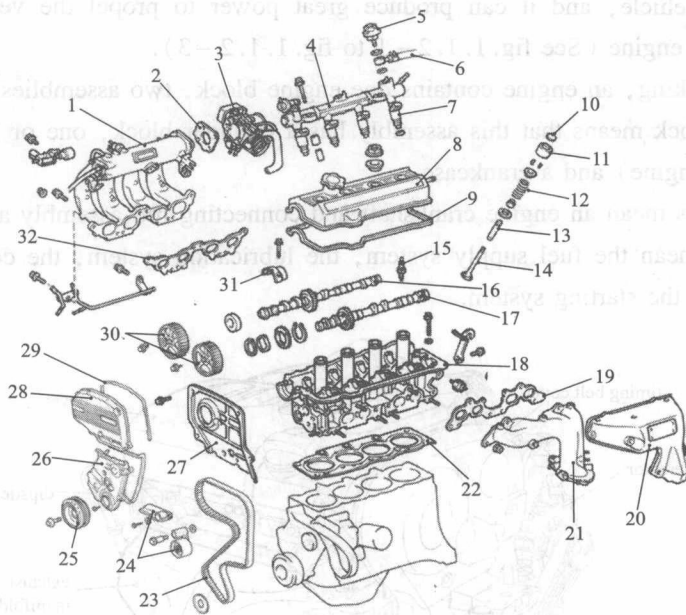


Fig. 1.1.2-3 Main Engine Components (c)

- 1—intake manifold; 2—gasket; 3—throttle body; 4—fuel rail; 5—fuel damper; 6—fuel line; 7—injector;
 8—valve cover; 9—gasket; 10—shim; 11—bucket tappet; 12—valve spring; 13—valve guide;
 14—valve; 15—spark plug; 16—intake camshaft; 17—exhaust camshaft; 18—cylinder head;
 19—gasket; 20—shield; 21—exhaust manifold; 22—cylinder-head gasket; 23—timing belt;
 24—tensioner; 25—crankshaft pulley; 26-28—timing belt covers; 29—gasket;
 30—camshaft pulleys; 31—bearing cap; 32—gasket

1.1.3 Four Strokes Operation

Have you ever opened the hood of your auto and wondered what was going on there? An automotive engine looks 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. Now we'll discuss the basic idea behind an engine operation (See fig. 1.1.3-1).

As we know, the internal combustion engine (ICE) seems to be the one most commonly used in the automotive field. According to the fuel energy used, internal combustion engines are further divided into gasoline engines, kerosene engines, diesel engines, etc.



Fig. 1.1.3-1 Engine Compartment

Most automotive engines operate on the four strokes to convert gasoline into motion. The power production cycle consists of four strokes of the piston reciprocating motion. The four strokes are illustrated in fig. 1.1.3-2. They are: intake stroke, compression stroke, power stroke, and exhaust stroke.

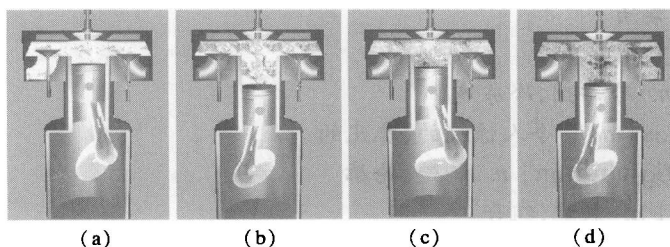


Fig. 1. 1. 3 - 2 Four Strokes of Engines

(a) Intake Stroke; (b) Compression Stroke; (c) Power Stroke; (d) Exhaust Stroke

Intake Stroke

On the intake stroke, when the piston moves downward to the bottom dead center (BDC), a vacuum is created in the cylinder. Meanwhile, the intake valve opens, and the air-fuel mixture is drawn into the cylinder through the valve port. Sometimes, the intake stroke can also be called "induction stroke."

Compression Stroke

After the piston reaches the bottom dead center (BDC), it begins to move upward. As this happens, the intake valve closes. The exhaust valve is also closed, so that the cylinder is sealed. As the piston moves upward, it compresses the trapped air-fuel mixture. The amount that the mixture is compressed is determined by the compression ratio of the engine. The compression ratio on the average engine is in the range of 8:1 to 10:1. It means that when the piston reaches the top of the cylinder, the air-fuel mixture is squeezed to about one tenth of its original volume.

Power Stroke

As the piston reaches the top dead center (TDC) on the compression stroke, an electric spark is produced at the spark plug. The ignition system delivers a high tension current to the spark plug to produce the spark, and ignites the air-fuel mixture. Each spark plug fires at a different time, which is determined by the engine firing order. The power process pushes the piston down the cylinder with great force turning the crankshaft to provide the power to propel the vehicle.

Exhaust Stroke

As the piston reaches the bottom dead center (BDC) again, the exhaust valve opens to allow the exhaust gas or burned gas to be expelled through the exhaust-valve port. Since the cylinder contains so much pressure, when the valve opens, the gas is expelled with a violent force. That is why a vehicle without a muffler sounds so loud. The piston travels up to the top of the cylinder pushing all the exhaust out before closing the exhaust valve in preparation for starting the four-stroke process over again.

Words

combustion [kəm'bastʃən] *n.* 燃烧

Volkswagen [vəʊks'wægən] *n.* 大众

cylinder ['silində] *n.* 汽缸, 泵体

gasoline ['gæsəli:n] *n.* 汽油

- diesel [ˈdiːzəl] *n.* 柴油
- stroke [strəʊk] *n.* 冲程,行程
- coolant [ˈkuːlənt] *n.* 冷却剂,冷冻液
- marvelous [ˈmɑːvələs] *adj.* 令人惊叹的,非凡的
- configuration [kənˌfɪɡjuˈreɪʃən] *n.* 构造,轮廓
- assembly [əˈsembli] *n.* 装配,组合
- crankcase [ˈkræŋkkeɪs] *n.* 曲轴箱
- crankshaft [ˈkræŋkfɑːft] *n.* 曲轴
- lubrication [ˌluːbrɪˈkeɪʃən] *n.* 润滑,润滑油
- ignition [ɪɡˈniʃən] *n.* (汽车引擎的)发火装置,点火
- component [kəmˈpəʊnənt] *n.* 零件,组件,成分,部件
- manifold [ˈmæniˌfəʊld] *n.* 歧管(汽车引擎用于进气或排气)
- gasket [ˈɡæskɪt] *n.* 垫圈
- damper [ˈdæmpə] *n.* 阻尼器,减震器,风门,挡板
- injector [ɪnˈdʒektə] *n.* 喷油器
- shim [ʃɪm] *n.* 垫片
- tappet [ˈtæpɪt] *n.* 推杆,挺杆
- valve [vælv] *n.* 气门,阀
- tensioner [ˈtenʃənə] *n.* 张紧器
- pulley [ˈpʊli] *n.* 皮带轮
- camshaft [ˈkæmfɑːft] *n.* 凸轮轴
- hood [hʊd] *n.* 发动机罩
- automotive [ɔːtəˈməʊtɪv] *adj.* 汽车的
- jumble [ˈdʒʌmbl] *vt. & vi.* 使混杂 *n.* 混乱,杂乱的一堆
- uninitiated [ˌʌnɪˈniʃieɪtɪd] *adj.* 缺乏某种特定知识和经验的
- curiosity [ˌkjʊəriˈɒsɪti] *n.* 好奇心,求知欲
- reciprocate [rɪˈsɪprəkeɪt] *vt. & vi.* (使)往复运动
- piston [ˈpɪstən] *n.* 活塞
- port [pɔːt] *n.* 通道
- induction [ɪnˈdʌkʃən] *n.* 吸入
- seal [siːl] *n. & v.* 密封
- compress [kəmˈpres] *vt.* 压缩
- squeeze [skwiːz] *vt. & vi. & n.* 挤,压
- ignite [ɪɡˈnaɪt] *vt. & vi.* 点火,使燃烧
- tension [ˈtenʃən] *n.* 紧张,张紧力,拉力
- current [ˈkʌrənt] *n.* 电流,气流,水流 *adj.* 当前的,流行的
- propel [prəˈpel] *vt.* 推进,驱使
- expel [ɪksˈpel] *vt.* 排出,喷出(空气等)
- muffler [ˈmʌflə] *n.* 消音器
- preparation [ˌprepəˈreɪʃən] *n.* 准备工作,准备措施

Phrases and Expressions

electric motor 电动机
 steam engine 蒸汽机
 in line 直列
 gasoline engine 汽油机
 diesel engine 柴油机
 engine block 发动机机体
 cylinder block 汽缸体
 cylinder head 汽缸盖
 connecting rod 连杆
 crankshaft and connecting rod assembly 曲柄
 连杆机构
 valve train 配气机构
 fuel supply system 燃油供给系统
 lubrication system 润滑系

ignition system 点火系
 starting system 启动系
 intake manifold 进气歧管
 throttle body 节气门体
 spark plug 火花塞
 intake stroke 进气冲程
 compression stroke 压缩冲程
 power stroke 做功冲程
 exhaust stroke 排气冲程
 air-fuel mixture 可燃混合气
 compression ratio 压缩比
 original volume 原容积
 firing order 点火顺序
 exhaust gas 废气

Abbreviations

ICE (internal combustion engine) 内燃机
 BDC (bottom dead center) 下止点

TDC (top dead center) 上止点

Practice

- What do almost all cars use to convert gasoline into motion?
 - One-stroke combustion cycle.
 - Two-stroke combustion cycle.
 - Three-stroke combustion cycle.
 - Four-stroke combustion cycle.
- Which of the following does not aid in the powering of most mainstream cars today?
 - Gas.
 - Battery.
 - Solar energy.
 - Alternator.
- A car engine's job is to _____.
 - convert fuel into heat
 - convert fuel into motion
 - convert fuel into exhaust
- A car uses a four-stroke engine. The four strokes are _____.
 - intake, compression, ignition and exhaust
 - injection, rotation, ignition and exhaust
 - injection, carburetion, rotation and exhaust
- A device that works on the same principle as a car engine is _____.
 - a nuclear submarine
 - a jackhammer
 - a spud gun
- In the intake stroke, the crankshaft has rotated about _____.

- A. 90 degrees B. 180 degrees C. 360 degrees D. 720 degrees
7. Near the end of the downward movement of the piston on the power stroke, the camshaft opens the _____, but the _____ remains closed.
- A. exhaust valve; exhaust valve B. exhaust valve; intake valve
C. intake valve; exhaust valve D. intake valve; intake valve
8. With the _____ at the bottom of the cylinder, the exhaust valve opens to allow the burned exhaust gas to be expelled to the exhaust system.
- A. piston B. valve C. camshaft D. crankshaft
9. According to the method of ignition of the air-fuel mixture, engines are divided into _____.
A. gas engine and steam engine
B. gasoline engine and diesel engine
C. external combustion engine and compression ignition engine
D. internal combustion engine and diesel engine
10. According to the classification of valve arrangement, the engines have _____.
A. four-cylinder engine, six-cylinder engine and eight-cylinder engine
B. in-line engine, V-shape engine, opposed engine
C. I-head engine, F-type engine, I-head engine
D. air-cooled engine, water-cooled engine

1.2 Engine Block

In engine block, the cylinder block is the main supporting structure to which all other engine parts are attached. It contains two main sections: cylinder section and crankcase section (See fig. 1.2 - 1 and fig. 1.2 - 2).

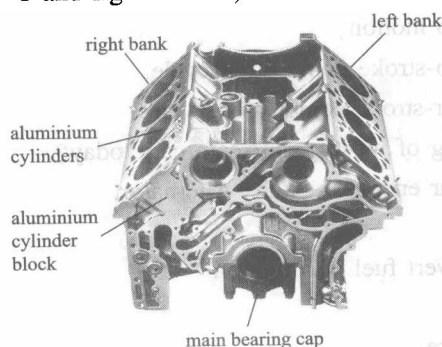


Fig. 1.2 - 1 Cylinder Block and Crankcase (a)

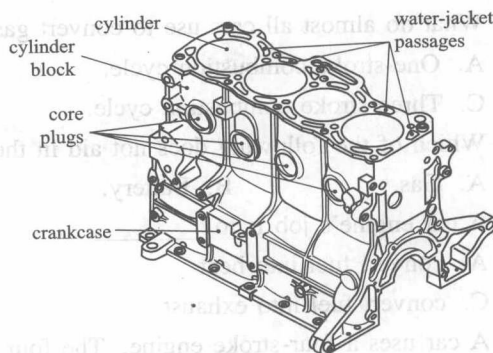


Fig. 1.2 - 2 Cylinder Block and Crankcase (b)

The cylinder block is a single machined casting unit. It contains cylinders, cylinder heads, coolant passages or water sockets, and lubrication passages. And there is a drilled passageway within some blocks for the camshaft. In addition, the crankshaft is housed in the crankcase at the bottom of the cylinder block. Usually, it is cast into one piece, and made from cast iron. However, in modern engine, it is also made from aluminium and magnesium, so that it can be