

汽车专业英语教案

学年第一学期

顺序号：（ 1 ）

主讲教师		职称		系、部 教研室	
课程名称	汽车专业英语			本教案 授课学时	
本次课标题	The basic structure of an Automobile				
授课班级及 时间					
教学目标	<p>专业能力</p> <p>了解汽车的基本知识，及其基本知识的英语表达，扩大学生的汽车专业英语的词汇量，能够阅读基本的汽车英语文章。</p> <p>职业能力</p> <p>1、掌握汽车主要构造的英语单词和表达，应对今后工作中出现的与之相关的问题。</p> <p>2、了解汽车大体构造的基础和英语表达，并能应用于汽车维修、对外贸易，采购等工作。</p> <p>社会能力</p> <p>提高学生对汽车专业英语的认识，增加学生汽车专业词汇量，开拓视野，提高汽车知识的广度，通过教材文章的学习，课堂活动训练，让学生对社会人际交往、社会生活有所认知</p>				
教学 主要内容	<p>一、 the main part of automobile</p> <p>二、 the body,engine, suspension, brake, transmission of automobile</p>				
教学重点、 难点	<p>重点： 1、汽车主要构造的单词表达。</p> <p>难点： 1、如何用英语介绍汽车部件。</p>				

教学手段、 方法	多媒体教学，主题讲授法
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● **新课导入:**

众所周知，现在英语在我们的学习和生活中显得越来越重要，我们常常会去看一步英文大片，或者阅读一份英文报纸，来更好的了解世界.而对于我们学习汽车的同学来说，除了学好日常英语外，学习专业英语就显得更加重要了。

学习专业英语前，让我们看一些简单的汽车单词，我们就会不知所措，更不要说去写点什么了，可是学习汽车英语后我们有了一些基础，不仅认识了一些简单的汽车单词，甚至还能够用英语写出所学的一些汽车构造.我想这就是我的收获吧，从中足以看出汽车英语的重要性，而这只是在学校而已

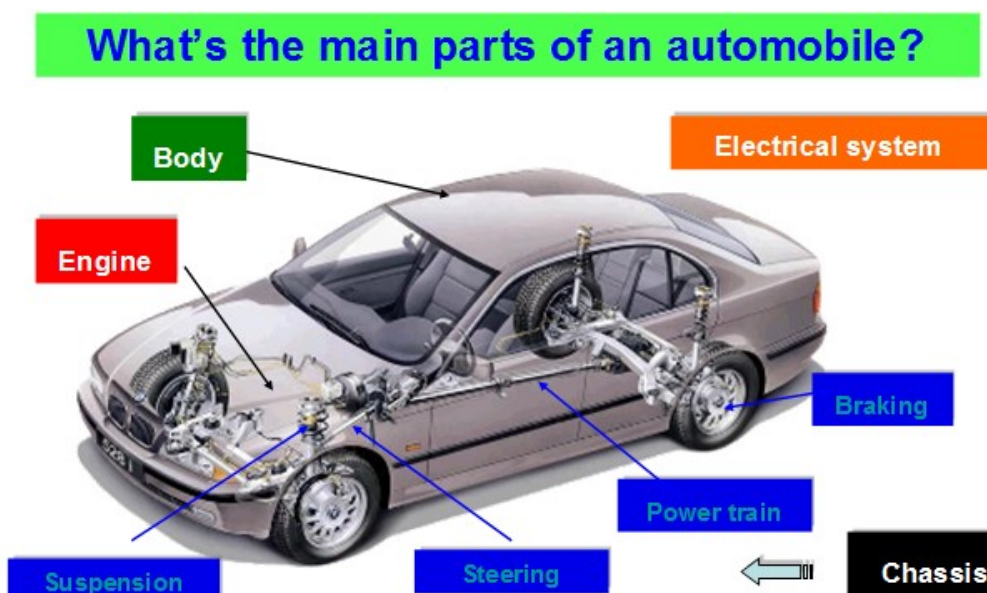
随着我们进入工作岗位，汽车英语的重要性应该会更好的体现出来，面对一合进口的设备，我们可以顺利的去操镑面对一份英语的订单，我们也可以轻松处理;面对来考察的外商，我们可以给他用英语来介绍我们的设备和产品。

总而言之，专业英语对我们的作用更大，是我们学习和工作不可或缺的。

● **教学过程和教学内容设计:**

Unit1 The Basics Structure of an Automobile

一、the main part of automobile



Today’s average automobile contains more than 15,000 separate parts that they must work together. These parts can be grouped into four major categories: engine, body, chassis and electrical equipments. The layout of modern automobile is shown as Fig.1.1.

二、

1. the engine of automobile

The engine supplies the power for the vehicle. Most automotive engines are located at the front of the vehicle and drive the wheels through a power train made up of **gear, shafts, and other mechanical and hydraulic components**. Most automotive vehicles are powered by a four-stroke-cycle internal combustion engine. The in-line four-cylinder engine and V-type six-cylinder engine are the most widely used, with V-8 engine are also common. Some passenger cars and trucks have diesel engines.

2. Body

- ◆ sheet-metal
- ◆ plastic or composite material panels
- ◆ windows, door, seat, upholstery, other parts
- ◆ older vehicle design:
newer passenger-car design:

3. Transmission

provides different forward gear ratios between the engine and drive wheel, as well as reverse.

- ◆ manual transmission
- ◆ automatic transmission
- ◆ final drive(主减速器)
- ◆ speed- reduction gear set
- ◆ defferential (差速器) , axle shafts (半轴)

4. Electrical Equipment

- ◆ electronic fuel injection (电子燃油喷射)
- ◆ carburetor(化油器)
- ◆ spark timing(点火正时)

● 教学小结与拓展:

- 一、了解每种汽车的英文表达
- 二、认识汽车组要结构的基本单词;
- 三、能够翻译简单的专业英语短文。

● 布置作业或思考题:

默写课文中出现的新单词

教案首页

2012-学年第二学期

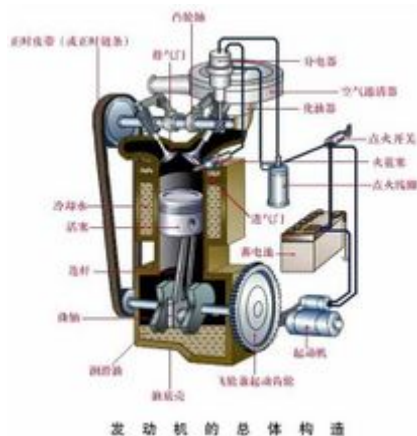
顺序号: (2)

主讲教师		职称		系、部 教研室	
课程名称	汽车专业英语			本教案 授课学时	4
本次课标题	Unit2 The basic principle of Engine				
授课班级及 时间				年 9 月 5 日	
				年 9 月 9 日	
				年 月 日	
教学目标	<p>专业能力</p> <p>了解汽车发动机的基本知识及其基本知识的英语表达, 扩大学生的汽车发动机专业英语的词汇量, 能够阅读简单的汽车发动机英语短文。</p> <p>职业能力</p> <p>一、发动机的基本介绍英文表达学习</p> <p>二、发动机气缸的排列种类英文词汇</p> <p>社会能力</p> <p>提高学生对汽车专业英语的认识, 增加学生汽车专业词汇量, 开拓视野, 提高汽车知识的广度。</p>				
教学 主要内容	<p>一、 the internal combustion engine</p> <p>二、 the way engine cylinders are arranged</p>				
教学重点、 难点	<p>重点: 汽车发动机的单汇。</p> <p>难点: 发动机的英语短文翻译。</p>				
教学手段、 方法	多媒体教学, 主题讲授法				

● 新课导入:

发动机 (Engine) 是一种能够把其它形式的能转化为机械能的机器, 包括如内燃机 (汽油发动机等)、外燃机 (斯特林发动机、蒸汽机等)、电动机等。如内燃机通常是把化学能转化为机械能。发动机既适用于动力发生装置, 也可指包括动力装置的整个机器 (如汽油发动机、航空发动机)。发动机最早诞生在英国, 所以, 发动机的概念也源于英语, 它的本义是指那种“产生动力的机械装置”。

明白了什么是外燃机, 也就知道了什么是内燃机。



发动机结构示意图 (图1)

这一类型的发动机与外燃机的最大不同在于它的燃料在其内部燃烧。内燃机的种类十分繁多, 常见的汽油机、柴油机是典型的内燃机。不常见的火箭发动机和飞机上装配的喷气式发动机也属于内燃机。不过, 由于动力输出方式不同, 前两者和后两者又存在着巨大的差异。一般地, 在地面上使用的多是前者, 在空中使用的多是后者。今天我们就从英语这个角度介绍一下内燃机 Engine。

● 教学过程和教学内容设计:

Chapter 2 Engine

一、the internal combustion engine

internal combustion	内燃机	combustion	燃烧
cylinder	气缸	gasoline	汽油、汽油机
diesel	柴油机	spark	火花
ignition	点火	spark-ignition engine	火花点火式发动机
compression-ignition engine	压缩点火式发动机		

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 power train.

发动机作为动力设备，常见的类型是内燃机，其原理是通过发动机缸内的液体燃料燃烧而产生能量。发动机可分为两类：汽油机（点燃式）和柴油机（压燃式），都属于热力发动机。燃料燃烧产生热量使缸内气压上升，产生的能量驱动轴旋转，并传递给动力传动系。

二、the way engine cylinders are arranged

configuration	组态、配置	In-line engines	直列式发动机
vertical	垂直	crankshaft	曲轴
block	缸体		

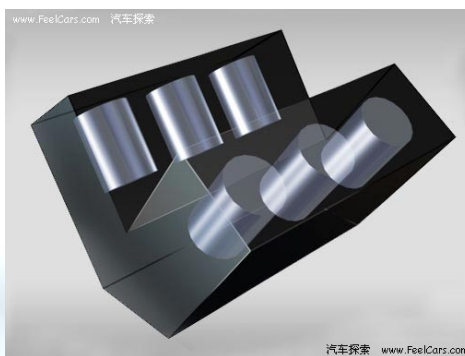
the way engine cylinders are arranged is called engine configuration. In-line engines have the cylinders in a line. The design creates a simply cast engine block. In vehicles applications, the number of cylinders is normally from 2 up to 6. Usually, the cylinders are vertical. As the number of the cylinders increase, the length of the block and crankshaft can become a problem. One way to avoid this is with a V configuration. The design makes the engines block and crankshaft shorter and more rigid.

发动机的布置即发动机气缸的排列方式。发动机缸体按直线排列的即直列式，这种布置使得发动机缸体结构简单。汽车发动机一般为2~6缸，通常气缸是垂直放置的，但气缸数量的增加会导致缸体和曲轴的长度过大，解决问题的措施之一就是采用V型布置，这种布置方式可以使发动机缸体和曲轴长度尺寸更短，从而大大增加刚度。

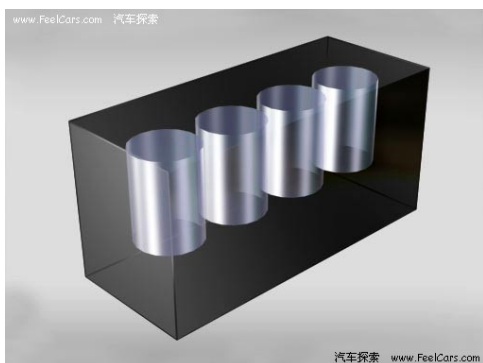
The basic cylinder arrangements of a diesel or gas-burning engine are: cylinder-in-line; V-arrangement and Flat.



Flat (平放式)



V-arrangement (V形排列式)



cylinder-in-line (直列式)

An engine located at the front can be mounted longitudinally (纵向) and can drive either the front or the rear (后) wheels. Rear engine vehicles have the engine mounted behind the rear wheels. The engine can be transverse (横向) or longitudinal and usually drive the rear wheels only.

前置发动机可以纵向布置，能够驱动前轮或后轮。后置发动机布置在后轮后侧，发动机即可纵向布置又可横向布置，一般只能驱动后轮。

New word

Internal combustion engine: 内燃机、外燃机

Cylinder: 汽缸 圆柱体

Gasoline//diesel: 汽油 柴油

Ignition: 点燃 ignite

Shaft // Crankshaft: 轴 曲轴

Transmission 传输

Configuration 组态、配置

Longitudinal: 纵向

Transverse: 横向

● 教学小结与拓展:

- 一、了解发动机的内部构造及其英文表达。
- 二、掌握汽车发动机的英文单词；
- 三、能够翻译简单的专业英语短文。

● 布置作业或思考题：

默写课文中出现的新单词

教案首页

2012-学年第二学期

顺序号：（ 3 ）

主讲教师		职称		系、部 教研室	机电与信息工程系
课程名称	汽车专业英语			本教案 授课学时	4
本次课标题	Unit3 Crank and Connecting Rod Mechanism and Valve train				
授课班级及 时间	2012 级汽车检测与维修技术 1 班			年 9 月 16 日	
	2012 级汽车检测与维修技术 1 班			年 9 月 23 日	
				年 月 日	
教学目标	<p>能力目标</p> <p>了解曲轴和连杆系统和配气系统的基本知识及其基本知识的英语表达 扩大学生曲轴和连杆系统和配气系统专业英语的词汇量，能够阅读简单的 汽车内燃机英语短文。</p> <p>知识目标</p> <p>一、曲轴和连杆系统和配气系统的基本介绍英文表达学习 二、曲轴和连杆系统和配气系统英文词汇</p> <p>素质目标</p> <p>提高学生对汽车专业英语的认识，增加学生汽车专业词汇量，开拓视 野，提高汽车知识的广度。</p>				
教学 主要内容	<p>一、Crank and Connecting Rod Mechanism</p> <p>二、Valve train</p>				

教学重点、 难点	重点：曲轴和连杆系统和配气系统的词汇。 难点：曲轴和连杆系统和配气系统的英语短文翻译。。
教学手段、 方法	多媒体教学，讲授法

● **新课导入:**

内燃机 (Internal combustion engine) 是将液体或气体燃料与空气混合后, 直接输入汽缸内部的高压燃烧室燃烧爆发产生动力。这也是将热能转化为机械能的一种热机。内燃机具有体积小、质量小、便于移动、热效率高、起动性能好的特点。但是内燃机一般使用石油燃料, 同时排出的废气中含有有害气体的成分较高。

今天我们就开学习内燃机的结构英语。

● **教学过程和教学内容设计:**

Unit 3 Crank and Connecting Rod Mechanism and Valve train

1) New word

Crankshaft and Connecting rods system

曲柄连杆机构

Valve system 配气机构

Fuel system 供给系

Ignition system 点火系

Starting system 起动系

Cooling system 冷却系

Lubrication system 润滑系

TDC (Top Dead Center) :

the position of the crank (曲柄) and piston when the piston (活塞) is farthest away from the crankshaft.

BDC (Bottom Dead Center) :

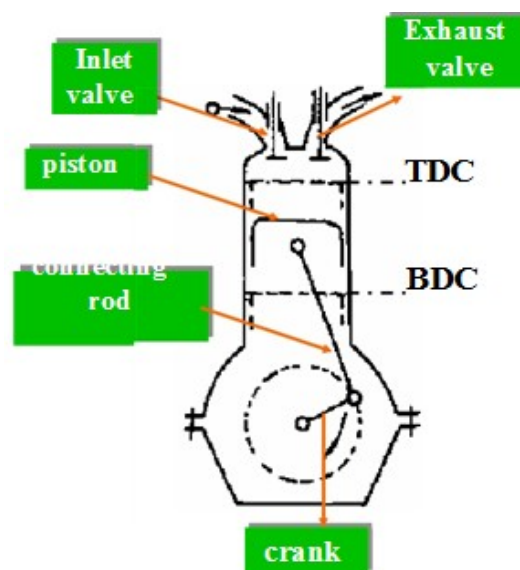
the position of the crank and piston when the piston is nearest away from the crankshaft.

Swept vol. (有效/工作容积) :

the volume between TDC and BDC.

Clearance vol. (余隙/燃烧室容积) :

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



Engine capacity (排量) :

this is the swept volume of all cylinders.

Compression ration (压缩比) :

$(\text{swept vol.} + \text{clearance vol.}) / (\text{clearance vol.})$

vol.)

1. Intake/Induction stroke 进气行程
2. Compression stroke 压缩行程
3. Power stroke 做功行程
4. Exhaust stroke 排气行程

2) Linking the piston by a connecting rod to a crankshaft causes the gas to rotate the shaft through half a turn. The power stroke "uses up" the gas, so means must be provided to expel the burnt gas and recharge the cylinder with a fresh petrol-air mixture: this control of gas movement is the duty of the valves;

活塞通过连杆和曲轴连接，使得气体带动曲轴旋转半圈。做功冲程耗尽了所有的气体，这样就必须采取相应的措施排出废气以及向气缸内再充入新鲜的可燃混合气：气体的运动由气门来控制。

1) The engine block is the basic frame of the engine. All other engine parts either fit inside it or fasten to it. It holds the cylinders, water jackets, and oil galleries. The engine block also holds the crankshaft, which fastens to the bottom of the block.

缸体是内燃机的基体。内燃机其它的部件都安装或固定在缸体上，包括气缸、水套和油道，以及固定在缸体底部的曲轴等。

2) Cylinder sleeves are used in engine blocks to provide a hard wearing material for pistons and piston rings. The block can be made of one kind of iron that is light and easy to cast while the sleeves uses another that is better able to stand up wear and tear (磨损). There are two main types of sleeves: dry and wet.

缸体中的气缸套为活塞和活塞环提供了一种坚硬耐磨的材料。缸体可以采用某种重量轻且易铸造的铁来制造，而缸套使用的却是另一种更加耐磨损的材料制成。主要有两种类型的气缸套：干缸套和湿缸套。

3) The cylinder head fastens to the top of the block, just as a roof fits over a house. The underside forms the combustion chamber with the top of the piston. In-line engines of light vehicles have just one cylinder head for all cylinders; larger in-line engines can have two or more.

气缸盖安装在缸体的顶部，就像安在房子上的屋顶一样。缸盖的下方和活塞顶部形成燃烧室。轻型车上使用的直列内燃机，所有气缸仅有一个气缸盖，较大的直列内燃机有两个或更多缸盖。

4) The oil pump in the lubricating system draws oil from the oil pan and sends it to all working parts in the engine. The oil drains off and runs down into the pan. Thus, there is constant circulation of oil between the pan and the working parts of the engine.

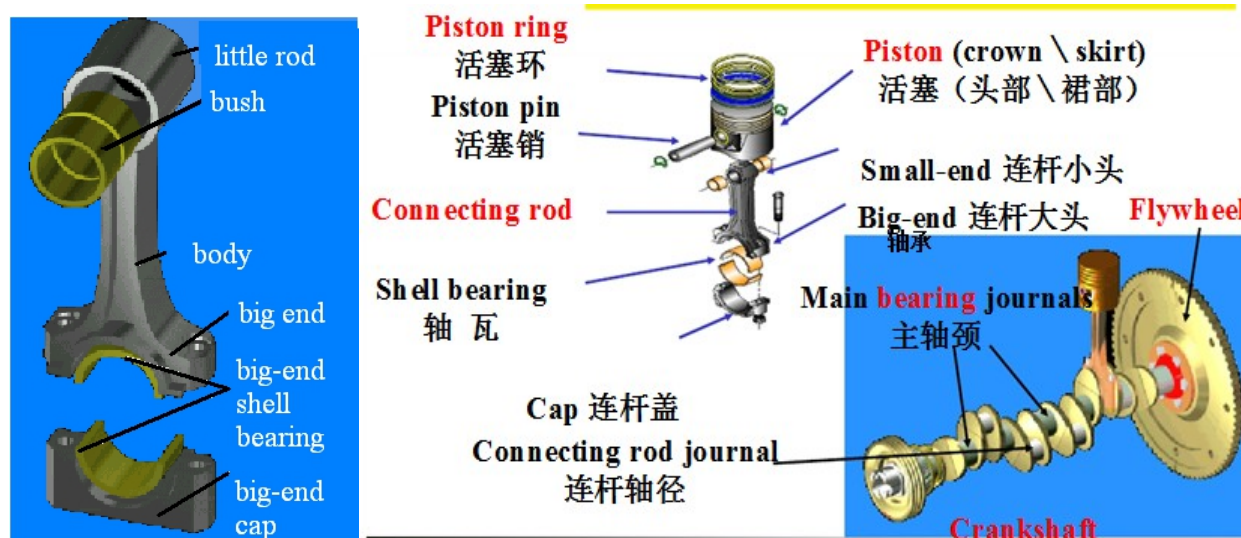
润滑系的机油泵从油底壳抽出机油，并把机油输送给内燃机的所有工作部件。机油从油底壳流进流出。因而在油底壳和内燃机的工作部件之间就有机油定向循环流动。

1) Most pistons are made from cast aluminum(铝). The piston, through the connecting rod, transfers to the crankshaft the force created by the burning fuel mixture. This force turns the crankshaft.

大多数活塞由铝铸造而成。通过连杆的作用，活塞把可燃混合气燃烧产生的力传递给曲轴，带动曲轴旋转。

2) In diesel engines, the combustion chamber (燃烧室) may be formed totally or in part in the piston crown, depending on method of injection (喷油) .

柴油机内燃机根据喷油方法不同，活塞头部可以形成全部燃烧室，也可以是燃烧室的一部分。



3) In modern engines, each piston has three rings. (Piston in older engines sometimes had four rings, or even five.) The inside surface of the ring fits in the groove (槽) on the piston. The ring's outside surface presses against the cylinder walls.

在新型内燃机上，每个活塞有三个活塞环。(在老式内燃机上，每个活塞有四个甚至五个活塞环) 环的内侧装在活塞的环槽里，环的外表面紧压在气缸壁上。

4) The connecting rod little end is connected to the piston pin. A bush made from a soft metal, such as bronze (青铜), is used for this joint. The lower end of the connecting rod fit the crankshaft journal. This is called the big end.

连杆小头与活塞销连接，连接处有像青铜这样软金属制成的衬套，连杆下端连接在曲柄轴径上，称为连杆大头。

● **教学小结与拓展：**

- 一、了解曲轴和连杆系统和配气系统构造及其英文表达。
- 二、掌握汽车曲轴和连杆系统和配气系统的英文单词；
- 三、能够翻译简单的专业英语短文。

● **布置作业或思考题：**

默写课文中出现的新单词

教案首页

2012-学年第二学期

顺序号：（ 4 ）

主讲教师		职称		系、部 教研室	机电与信息工程系
课程名称	汽车专业英语			本教案 授课学时	4
本次课标题	Unit 4 Fuel Supply System				
授课班级及 时间	2012 级汽车检测与维修技术 1 班			年 9 月 30 日	
	2012 级汽车检测与维修技术 1 班			年 10 月 14 日	
				年 月 日	

<p>教学目标</p>	<p>能力目标</p> <p>了解汽车燃油供应系统的基本知识及其基本知识的英语表达，扩大学生的燃油供应系统专业英语的词汇量，能够阅读简单的燃油供应系统相关的英语短文。</p> <p>知识目标</p> <p>一、掌握相关的单词</p> <p>二、燃油供应系统的英文介绍</p> <p>素质目标</p> <p>提高学生对汽车专业英语的认识，增加学生汽车专业词汇量，开拓视野，提高汽车知识的广度。</p>
<p>教学主要内容</p>	<p>Part 1 The introduction of Fuel supply System</p> <p>Part 2 Principle and Construction</p> <p>Part 3 Electronic Fuel System</p>
<p>教学重点、难点</p>	<p>重点: The introduction of Fuel supply System</p> <p>难点: The introduction of Fuel supply System</p>
<p>教学手段、方法</p>	<p>多媒体教学，讲授法</p>

● **新课导入:**

燃油供应系统的任务是根据发动机各种不同工况的要求，配制出一定数量和浓度的可燃混合气，供入气缸，使之在临近压缩终了时点火燃烧而膨胀做功。最后，供给系统还应将燃烧产物——废气排入大气中。

● **教学过程和教学内容设计:**

Unit4 Fuel Supply System

step 1 New Words and Phrases

Injection	internal combustion engine	carburetor	vaporize	gasoline	
equivalent	fuel filter	fuel tank	compromise	gas gauge baffle	vent system
hydrocarbon	emissions	charcoal canister	mechanical pump	electric fuel pump	
severe	occur	injector	valve	EFI	

Step2 explain and translate the text

The introduction of Fuel supply System

The cam (凸轮) rotates in coordination with (协调) the crankshaft. The metal shaft, called the camshaft, typically has individual cams for each valve in the engine. The cam rotating could open an inlet valve for an intake stroke, or open an exhaust valve for an exhaust stroke.

凸轮安装在同曲轴协调运转的一根轴上，该轴称为凸轮轴，其上有同发动机每一个气门对应的凸轮。当凸轮轴旋转时，在进气冲程打开进气门，在排气冲程打开排气门。

When the engine runs in compression stroke and power stroke, the valves must close tightly on their seats to produce a gas-tight seal (气密性) and thus prevent the gases escaping from the combustion chamber. If the valves don't close fully the engine will not develop full power.

当发动机在压缩冲程和作功冲程工作时，气门必须紧贴在气门座上，形成良好的气密性以防止燃烧室漏气。如果气门关闭不严，发动机就不能发挥出全部的功率。

So that the valves can close fully some clearance is needed in the operating mechanism. This means that the operating mechanism must be able to move sufficiently far enough away from the valve to allow the valves to be fully closed against its seat by the valve spring. However, if the clearance is set too great this will cause a light metallic tapping noise.

所以在气门传动机构中要预留一些间隙使气门得以完全关闭。这就是说，气门传动机构运动要与气门有一个充分远的距离，使得气门在气门弹簧作用下紧闭气门座。可是如果间隙过大，会引起轻微的金属敲打声。

It is apparent from this description that the exhaust valve stays open for a short period of time during which the intake valve is also open. In other words, the end of the exhaust stroke and the beginning of the intake stroke overlap for a short period of time. This is called valve overlap. Valve timing and valve overlap vary on different engines.

由上显而易见，排气门在进气门打开的一小段时间内也打开着。换句话说，排气冲程終了和进气冲程初期有一小段时间的重叠，这称为气门重叠。不同的发动机，其配气正时和气门重叠是不一样的。

Opening the intake valve before TDC and closing it after BDC increases the fill of air-fuel mixture in the cylinder. Opening the intake valve early helps overcome the static inertia of the air-fuel mixture at the beginning of the intake stroke, while leaving the intake valve open after BDC takes advantage of the kinetic inertia of the moving air-fuel mixture. This increases

volumetric efficiency.

在上止点前打开进气门和在下止点后关闭进气门可增加气缸内可燃混合气的进气量。提前打开进气门有助于克服进气冲程初期可燃混合气的静惯性，同时在下止点后保持进气门打开，可充分利用可燃混合气运动时的惯性，这可增加容积效率。

Each cam must revolve once during the four-stroke cycle to open a valve. A cycle, remember, corresponds with two revolutions of the crankshaft. Therefore, the camshaft must revolve at exactly half the speed of the crankshaft. This is accomplished with a 2:1 gear ratio. A gear connected to the camshaft has twice the number of teeth as a gear connected to the crankshaft.

在一个四冲程的循环里，每个凸轮转动一次来打开一个气门。在一个循环里曲轴是转动两圈的。因此，凸轮轴必须以曲轴转速的一半旋转，这是由 2:1 的传动比来实现的。连接凸轮轴的齿轮齿数是连接曲轴的齿轮齿数的 2 倍。

● 教学小结与拓展:

- 一、燃油供应系统相关的英文单词
- 二、燃油供应系统的英文介绍

● 布置作业或思考题:

默写本章节的专业单词

教案首页

2012-学年第二学期

顺序号：（ 5 ）

主讲教师		职称		系、部 教研室	机电与信息工程系
课程名称	汽车专业英语			本教案 授课学时	4
本次课标题	Unit 5 Cooling System and Lubrication				
授课班级及 时间	2012 级汽车检测与维修技术 1 班			年 9 月 30 日	
	2012 级汽车检测与维修技术 1 班			年 10 月 14 日	
				年 月 日	

<p>教学目标</p>	<p>能力目标</p> <p>了解汽车发动机冷却系统的基本知识及其基本知识的英语表达，扩大学生的汽车发动机冷却系统专业英语的词汇量，能够阅读简单的汽车发动机冷却系统相关的英语短文。</p> <p>知识目标</p> <p>一、汽车发动机冷却系统和润滑系统的基本功用的英文表达学习。</p> <p>二、汽车发动机冷却和润滑系统系统结构的英文学习。</p> <p>三、了解基本知识的英语表达，扩大学生的润滑系统专业英语的词汇量，能够阅读简单的润滑系统相关的英语短文。</p> <p>素质目标</p> <p>提高学生的专业英语的听、读能力，增加学生汽车专业词汇量，开拓视野，拓宽汽车知识的广度。</p>
<p>教学主要内容</p>	<p>Part 1 Cooling system</p> <p>Part 2 Lubrication system</p>
<p>教学重点、难点</p>	<p>重点: The basic components of a cooling system</p> <p>难点: The basic components of a cooling system</p>
<p>教学手段、方法</p>	<p>多媒体教学，主题讲授法。</p>

● **新课导入:**

发动机工作时, 气缸内的气体温度可高达 1727~2527C, 若不及时冷却, 将造成发动机零部件温度过高, 尤其是直接与高温气体接触的零件, 会因受热膨胀影响正常的配合间隙, 导致运动件受阻甚至卡死。此外, 高温还会造成发动机零部件的机械强度下降, 使润滑油失去作用等。这就需要冷却系统发挥作用了, 冷却系统的作用, 如何用读写关于冷却系统的文章, 就是我们这节课所要了解的。

● **教学过程和教学内容设计:**

Step1 New Worlds and Phrases

New Words

lubricate ['lu:brikeit] v. 润滑, 涂油

distribute [dis'tribju(:)t] v. 分配, 散布

filter ['filtə] n. 筛选, 滤波器, 过滤器

reduce [ri'dju:s] v. 减少, 分解, 减低

circulate ['sə:kjuleit] v. 循环, 流通(使)流传

lifeblood ['laifblʌd] n. 鲜血, 活力源泉

flush [flʌʃ] v. 冲洗

dirt [dɜ:t] n. 污垢, 泥土

deposit [di'pɔ:zɪt] n. 沉淀, 沉积物

particulate [pə'tɪkjulɪt] n. 微粒, 微尘

crud [krʌd] n. 杂质, 掺和物, 脏东西

scrub [skrʌb] v. 用力擦洗

baffle ['bæfl] n. 折流板(或挡板)

transfusion [træns'fju:ʒn] n. 输血, 输液

trapped [træpt] adj. 收集的, 截留的

interval ['ɪntəvəl] n. 间隔

drain [dreɪn] n. 排水, 排水管

fragment ['frægmənt] n. 碎片, 破片, 断片

splash [splæʃ] n. 溅的水, 污点

lubrication system 润滑系统

oil pump 机油泵, 油泵

engine oil 机器润滑油

oil filter 机油滤清器

oil screen 滤油网

worm gear 蜗轮传动装置, 蜗轮

pressure regulator valve 压力调节阀, 调压阀

filter media 滤料, 过滤介质

drain plug 放油塞, 排泄螺塞

Step2 Explain and Translate the Text

Text Cooling System

The purpose of the is to remove excess heat from the engine, to keep the engine operating at its most efficient temperature, and to get the engine up to the correct temperature as soon as possible after starting. Ideally, the cooling system keeps the engine running at its most efficient temperature no matter what the operating conditions are.

Cooling system

The basic components of a cooling system are radiator (散热器), radiator cooling fans (散热风扇), pressure cap (压力盖) and reserve tank (蓄水箱), water pump (水泵), and thermostat (恒温调解器)

Pressure Cap and Reserve Tank

The radiator pressure cap is a simple device that will maintain pressure in the cooling system up to a certain point.

If the pressure builds up higher than the set pressure point, there is a spring loaded valve that releases the pressure to prevent loss of coolant and to insure that coolant will return to the radiator from the coolant reserve tank.

Reserve Tank

The reserve tank has a filler opening, a cap and an overflow open to the atmosphere.

With this system the radiator is normally completely full.

When coolant in the engine expands and is forced out of the radiator, it overflows into the reserve tank.

When the engine cools down and the coolant contracts, the vacuum draws coolant from the reserve tank back into the radiator, thus keeping it full.

Water Pump

A water pump is a simple device that will keep the coolant moving as long as the engine is running. It is usually mounted in the front of the engine and turns whenever the engine is running. The water pump is driven by the engine through one of the fan belt or the timing belt.

The water pump is usually made of cast iron or cast aluminum.

There is a gasket to seal the water pump to the engine block and prevent the flowing coolant from leaking out where the pump is attached to the block.

Thermostat

The thermostat is simply a valve that measures the temperature of the coolant.

If the coolant is hot enough, the thermostat opens to allow it to flow through the radiator.

If the coolant is not hot enough, the flow to the radiator is blocked and fluid is directed to a bypass system that allows the coolant to return directly back to the engine.

The thermostat is usually located in the front, top part of the engine in a water outlet housing.

How Cooling System Works

The coolant follows a path that takes it from the water pump, through passages inside the engine block where it collects the heat produced by the cylinders.

It then flows up to the cylinder head where it collects more heat from the combustion chambers.

It then flows out past the thermostat through the upper radiator hose and into the radiator.

The coolant flows through the thin tubes of the radiator and is cooled by the air flow through the

radiator.

From there, it flows out of the radiator, through the lower radiator hose and back to the water pump.

By this time, the coolant is cooled off and ready to collect more heat from the engine.

Lubrication System

The engine lubrication system is designed to deliver clean oil at the correct temperature and pressure to every part of the engine.

The job of the lubrication system is to distribute oil to the moving parts to reduce friction between surfaces which rub against each other.

The basic components of the lubrication system

The lubrication system mainly consists of oil pump, engine oil, oil filter, oil screen and oil pan.

See

Oil Pump

An oil pump (油泵) being the heart of the system is located in the oil pan on the bottom of the engine. The pump is connected by a worm gear to either the crankshaft or the camshaft. In this way, when the engine is turning, the oil pump is pumping.

Most oil pumps have two small gears that mesh with each other. A pressure-regulator valve in the pump is used to prevent the lubrication system from reaching too high a pressure. The oil pump pulls oil up from the oil pan and makes the engine oil circulate through the engine. .

Engine Oil

Engine oil is often referred to as the lifeblood of an automobile engine. An engine running without oil will be just like a human without blood. Engine oil has several important jobs in the engine.

First, it must be circulated between moving engine parts to prevent metal-to-metal contact. Without oil, metal-to-metal contact produces wear. Oil between moving parts allows them to move easily, with less friction. The lower the friction of an engine, the more power it can develop. The circulating oil also cools the engine by carrying heat away from hot engine components, and

cleans or flushes dirt and deposits off the engine parts.

Finally, oil circulated on the cylinder walls seals the rings, improving the engine's compression.

Oil Filter (机油滤清器)

If engine oil is the lifeblood of an automobile engine, then the oil filter is the liver. Like the liver, the oil filter takes in dirty oil and removes the particulates and crud.

This engine damaging crud remains trapped in the filter media and the oil filter returns the clean oil back into the engine.

In addition to providing essential engine lubrication oil, this is also important for scrubbing the inside of the engine clean. Changing the oil and filter on a regular interval gives the engine a fresh transfusion for longer life.

Oil Screen

The oil pump pulls oil up from the oil pan through the oil screen.

The oil screen collects any large particles of dirt so that the oil entering the pump is fairly clean.

The pump then directs the oil through an oil filter, which strains any remaining dirt out of the oil, as the oil entering the engine lubrication passages should be clean.

Oil Pan

So long as engines require engine oil for them to run smoothly, engines will be equipped with oil pans to act as storage for such engine oil.

Therefore, the main function of the oil pan is to store the engine oil before it is pumped back again to the various engine parts.

Most engine oil pans have baffles that help control the flow direction of the oil, bringing it close to the oil pump for easier circulation.

Oil pans are often made from thin steel sheet with a coat of alloy materials that allow the engine oil to cool faster.

Further, most oil pans are equipped with magnetic drain plugs that not only allow the exit of old oil out of the pan, but also attracts the metal fragments that mixes with the oil.

Two methods are used to circulate oil through an engine: pressure and splash.

In modern engine designs, these two methods are often combined.

Pressure is developed by the oil pump, which delivers oil to the filter for cleaning before it is sent to the camshaft and valve train components at the top of the engine.

Other components are lubricated by splashing oil and by a net-work of passages.

● **教学小结与拓展:**

- 一、汽车发动机冷却润滑系统的基本功用的英文表达学习。
- 二、汽车发动机冷却和润滑系统结构的英文学习。

● **布置作业或思考题:**

默写本次课单词

教案首页

-学年第一学期

顺序号: (6)

主讲教师		职称		系、部 教研室	机电与信息工程系
课程名称	汽车专业英语			本教案 授课学时	4
本次课标题	Chapter6 Lubrication				
授课班级及 时间	2012 级汽车检测与维修技术 1 班			年 10 月 17 日	
	2012 级汽车检测与维修技术 1 班			年 10 月 21 日	
				年 月 日	
教学目标	<p>能力目标</p> <p>了解润滑系统的基本知识及其基本知识的英语表达，扩大学生的润滑系统专业英语的词汇量，能够阅读简单的润滑系统相关的英语短文。</p> <p>知识目标</p> <p>一、润滑系统系统的基本功用的英文表达学习。</p> <p>二、润滑系统系统结构的英文学习。</p> <p>素质目标</p> <p>提高学生的专业英语的听、读能力，增加学生汽车专业词汇量，开拓视野，拓宽汽车知识的广度。</p>				

<p>教学 主要内容</p>	<p>Part 1 The job of the lubrication system Part 2 The basic components oof the lubrication system</p>
<p>教学重点、 难点</p>	<p>重点: The basic components oof the lubrication system 难点: The basic components oof the lubrication system</p>
<p>教学手段、 方法</p>	<p>多媒体教学, 主题讲授法</p>