

普通高等教育机电类“十三五”规划教材



汽车专业英语

主 编 关云霞 梁 晨

- 新增纯电动汽车、混动汽车及燃料电池汽车等新能源汽车知识
- 详解汽车专业常用的800~1000个英语单词、词组及其用法
- 配套多篇专业文章作为阅读材料，附重点句的译文和语法注释



中国工信出版集团



电子工业出版社
PUBLISHING HOUSE OF ELECTRONICS INDUSTRY
<http://www.phei.com.cn>

内容简介

本书为普通高等教育机电类“十三五”规划教材，可作为高等院校机电类专业及相关专业的教材。

本书可作为高等院校机电类专业及相关专业的教材，也可供从事机电工作的工程技术人员参考。

本书可作为高等院校机电类专业及相关专业的教材，也可供从事机电工作的工程技术人员参考。

本书可作为高等院校机电类专业及相关专业的教材，也可供从事机电工作的工程技术人员参考。

汽车专业英语

关云霞 梁晨 主 编

李响 侯庆伟 副主编

袁文燕 秦洪艳 参 编

臧宇 王云蕾

电子工业出版社

Publishing House of Electronics Industry

北京·BEIJING

内 容 简 介

本书内容分三部分：汽车总体构造及主要系统的基本结构与原理（Unit 1~Unit 5）、汽车的维护与修理（Unit 6~Unit 7）、新能源汽车（Unit 8~Unit 10），涵盖汽车结构、汽车原理、汽车维修、新能源汽车等领域。使用本书的教师可根据教学需要，对教材内容进行取舍。本书还针对每个单元添加了大量的习题训练和插图，以便读者更好地理解课文的内容。

本书可作为高等院校车辆工程、汽车服务工程、交通运输等相关专业的教材，也可作为汽车专业人员进修英语的培训教材，还可作为汽车维修技术人员的参考用书。

未经许可，不得以任何方式复制或抄袭本书之部分或全部内容。

版权所有，侵权必究。

图书在版编目（CIP）数据

汽车专业英语 / 关云霞等主编. —北京：电子工业出版社，2018.3

普通高等教育机电类“十三五”规划教材

ISBN 978-7-121-33635-5

I. ①汽… II. ①关… III. ①汽车工程—英语—高等学校—教材 IV. ①U46

中国版本图书馆 CIP 数据核字(2018)第 022024 号

策划编辑：郭穗娟

责任编辑：郭穗娟

印 刷：辽宁泰阳广告彩色印刷有限公司

装 订：辽宁泰阳广告彩色印刷有限公司

出版发行：电子工业出版社

北京市海淀区万寿路 173 信箱 邮编 100036

开 本：787×1092 1/16 印张：9.75 字数：312 千字

版 次：2018 年 3 月第 1 版

印 次：2018 年 3 月第 1 次印刷

定 价：49.80 元

凡所购买电子工业出版社图书有缺损问题，请向购买书店调换。若书店售缺，请与本社发行部联系，联系及邮购电话：(010) 88254888, 88258888。

质量投诉请发邮件至 zltz@phei.com.cn，盗版侵权举报请发邮件至 dbqq@phei.com.cn。

本书咨询联系方式：(010) 88254502, guosj@phei.com.cn。



前言

PREFACE

汽车专业英语是汽车相关专业大学英语课程教学的一个重要组成部分,是促进学生完成从英语学习过渡到实际应用的有效途径。该课程是汽车服务工程、车辆工程、交通运输等相关专业的必修课,通过该课程的学习,学生不仅要熟悉和掌握本专业常用的英语单词、词组及其用法,而且应深化本专业的知识,加深理解,从而提高英语交流能力。

本书的编写思路是以学生为中心,以自主学习为主,让学生结合课外学习与应用,把基础阶段学到的语言知识在所学专业领域中得到应用、巩固、扩展和提高;进一步掌握良好的英语学习方法,打下扎实的专业英语知识基础;具备较强的专业英语应用能力,并能用英语进行专业知识的交流,更好地适应未来工作需要。

本书的教学目标是通过学习,使学生熟悉和掌握汽车专业常用的 800~1000 个英语单词、词组及其用法;巩固已经掌握的基本语汇和语法知识,牢固掌握专业词汇;掌握专业文章的语法结构,提高英语应用能力,达到以英语为工具获得专业知识、翻译和阅读相关专业文章的要求。

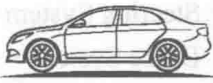
本书分三部分:第一部分汽车结构,主要讲解发动机构造及基本工作原理、底盘构造、汽车电气系统;第二部分汽车维修,汽车日常保养及维修相关知识;第三部分新能源汽车,主要讲解纯电动汽车、混合动力汽车及燃料电池汽车等新能源汽车的相关知识,这部分内容也是本书的一大特色,专业性较强,读者可根据需要对教材内容进行选择性的学习。此外,本书针对每个单元添加了大量的习题训练及课后阅读材料,供读者更好地理解课文的内容及进行相关知识的拓展。

本书由北京吉利学院的关云霞和北汽集团新技术研究院的梁晨担任主编,由北京工业大学的李响和北京交通运输职业学院的缙庆伟担任副主编,参编人员为上海大学的袁文燕、南京三江学院的秦洪艳、中国农业大学的臧宇和北京昌平职业学校的王云蕾。

由于编者水平有限,本书定然存在疏漏和欠妥之处,欢迎广大读者提出宝贵意见,以便今后修订改进。

编 者

2018 年 1 月

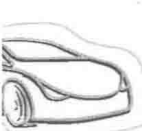


目录

CONTENTS

Chapter I Automobile Construction

Unit 1 The Basic Components of an Automobile	3
NEW WORDS AND PHRASES	5
NOTES TO THE TEXT	6
EXERCISES	7
READING MATERIAL	9
Unit 2 The Basic Principle of Engine	13
Text 1 Main Components and Classification of Engine	13
Text 2 Operating Principle of Spark-ignition Engine	16
NEW WORDS AND PHRASES	18
NOTES TO THE TEXT	19
EXERCISES	20
READING MATERIAL	22
Unit 3 The Basic Construction of Engine	24
Text 1 Crank and Connecting Rod Mechanism	24
Text 2 Valve Gear	27
Text 3 Fuel Supply System	29
Text 4 Cooling System	31
Text 5 Lubrication System	34
NEW WORDS AND PHRASES	36
NOTES TO THE TEXT	38
EXERCISES	39
READING MATERIAL	43



Unit 4 Chassis	48
Text 1 Power Train	48
Text 2 Steering System	50
Text 3 Brake System	52
Text 4 Suspension System	53
NEW WORDS AND PHRASES	53
NOTES TO THE TEXT	55
EXERCISES	56
READING MATERIAL	57
Unit 5 Electrical System	59
Text 1 Engine Electrical System	59
Text 2 Body Electrical System	63
NEW WORDS AND PHRASES	68
NOTES TO THE TEXT	70
EXERCISES	71
READING MATERIAL	74

Chapter II Maintenance and Repair

Unit 6 Periodic Maintenance	81
NEW WORDS AND PHRASES	84
NOTES TO THE TEXT	85
EXERCISES	86
READING MATERIAL	88
Unit 7 Auto Repair	90
NEW WORDS AND PHRASES	93
NOTES TO THE TEXT	94
EXERCISES	95
READING MATERIAL	97

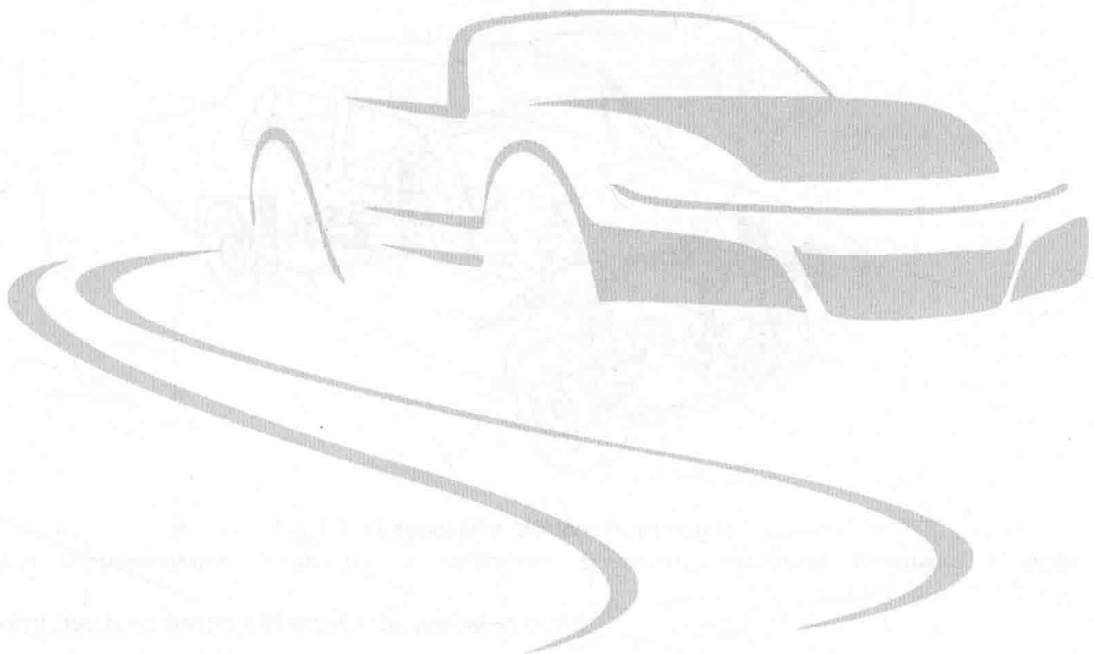
Chapter III New Energy Automobile

Unit 8 The Battery Electric Vehicle	103
NEW WORDS AND PHRASES	106

NOTES TO THE TEXT	107
EXERCISES	108
READING MATERIAL	109
NEW WORDS AND PHRASES	111
Unit 9 The Hybrid Electric Vehicle	112
NEW WORDS AND PHRASES	117
NOTES TO THE TEXT	118
EXERCISES	119
READING MATERIAL	121
NEW WORDS AND PHRASES	123
Unit 10 The Fuel Cell Electric Vehicle	124
NEW WORDS AND PHRASES	128
NOTES TO THE TEXT	129
EXERCISES	129
READING MATERIAL	131
附录 单词汇总	133
参考文献	148

■ Chapter I

Automobile Construction





Unit 1

The Basic Components of an Automobile

The motor vehicle consists of component assemblies and their individual components. The layout of the individual assemblies and their relative positions is not governed by invariable standards. Thus, for example, the engine may be designed as an independent assembly, or it may be integrated as a subassembly within a larger powertrain unit.

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 a modern automobile is shown as Fig.1.1.

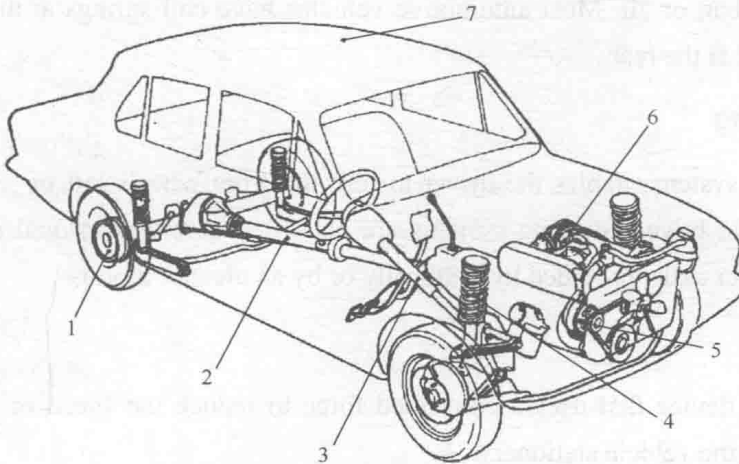


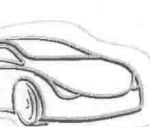
Fig.1.1 Layout of a Modern Automobile

1—brakes 2—transmission 3—steering 4—suspension 5—electrical equipment 6—engine 7—body

Every machine forms a complete technical system.

A rectangle is employed in graphic portrayals of technical systems. Input and output variables are represented by arrows. The number of arrows varies according to the number of input and output variables.

The motor vehicle is a complex technical system in which various subsystems operate in harmony to discharge a defined function. The function of the passenger car is to transport people, while the function of the motor lorry, or truck, is to carry cargo.



Engine

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 gears, 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 engines are also common. Some passenger cars and trucks have diesel engines.

Body

The automobile body is the assembly of sheet-metal, plastic or composite material panels together with windows, doors, seats, upholstery and other parts.

In older vehicle designs, the frame is a separate rigid structure; newer passenger-car designs have the frame and body structure combined into an integral unit.

Suspension

The suspension supports the weight of the vehicle, absorbs road shocks, transmits brake-reaction forces, helps maintain traction between the tires and the road. The springs may be coil, leaf, torsion bar, or air. Most automotive vehicles have coil springs at the front and either coil or leaf springs at the rear.

Steering

The steering system enables the driver to turn the front wheels left or right to control the direction of vehicle travel. Steering systems are classified as either manual steering or power steering, with power assist provided hydraulically or by an electric motor.

Brake

A brake is a device that uses a controlled force to reduce the speed or to stop a moving vehicle, or to hold the vehicle stationary.

Transmission

The transmission is the device in the power train that provides different forward gear ratios between the engine and drive wheels, as well as neutral and reverse. The two types of transmission are manual transmission, which the driver shifts by hand, and automatic transmission, which shifts automatically.

In power train, the final drive is the speed-reduction gear set that drives the differential. The differential is the gear assembly between axle shafts that permits one wheel to rotate at a speed different from that of the other (if necessary), while transmitting torque from the final-drive ring gear to the axle shafts.

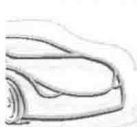


Electrical Equipment

Most automotive engines have electronic fuel injection instead of a carburetor. A computer-controlled engine managing system automatically manages various emissions devices and engine operation, including the fuel injection and spark timing.

NEW WORDS AND PHRASES

automobile [ˌɔ:təmə'bi:l]	<i>n.</i> 汽车
average ['ævərɪdʒ]	<i>adj.</i> 平均的, 普通的, 一般的
categories ['kætɪgəraɪz]	<i>n.</i> 种类, 类别
engine ['endʒɪn]	<i>n.</i> 发动机
body ['bɒdi]	<i>n.</i> 汽车车身
chassis ['ʃæsi]	<i>n.</i> 底盘
layout ['leɪ,aʊt]	<i>n.</i> 布局, 安排
power ['paʊə]	<i>n.</i> 动力, 功率
automotive [ɔ:tə'məʊtɪv]	<i>adj.</i> 有关汽车的; 机动(车)的
vehicle ['vi:ɪkl]	<i>n.</i> 交通工具, 车辆
power train	传动系
gear [giə]	<i>n.</i> 齿轮, 传动装置; <i>vt.</i> 齿轮传动; <i>vi.</i> 换挡
shaft [ʃɑ:ft]	<i>n.</i> 轴
mechanical [mi'kænikl]	<i>adj.</i> 机械学的; 力学的
hydraulic [haɪ'drɔ:lik]	<i>adj.</i> 液力的, 液压的
combustion [kəm'bʌstʃən]	<i>n.</i> 燃烧
stroke [strəʊk]	<i>n.</i> 冲程
cylinder ['sɪlɪndə]	<i>n.</i> 汽缸
passenger ['pæsɪndʒə]	<i>n.</i> 乘客
truck [trʌk]	<i>n.</i> 卡车, 载重汽车
diesel ['di:zəl]	<i>n.</i> 柴油
composite ['kɒmpəzɪt, -zait]	<i>adj.</i> 复合的, 合成的
material [mə'tɪəriəl]	<i>n.</i> 材料
panel ['pænl]	<i>n.</i> 仪表板; 控制板; 面板
upholstery [ʌp'həʊlstəri]	<i>n.</i> 车身衬里, 内饰
frame [freɪm]	<i>n.</i> 车架
rigid ['rɪdʒɪd]	<i>adj.</i> 刚硬的
integral ['ɪntɪgrəl]	<i>adj.</i> 完整的, 整体的
suspension [səs'penʃən]	<i>n.</i> 悬挂
transmit [trænz'mɪt]	<i>vt.</i> 传送



maintain [men'tein]	vt. 保持
traction ['trækʃən]	n. 驱动力
tire ['taɪə]	n. 轮胎
spring [sprɪŋ]	n. 弹簧
coil [kɔɪl]	n. 线圈, 螺旋(弹簧)
leaf [li:f]	n. 叶片
torsion ['tɔ:ʃən]	n. 扭转
rear [riə]	n. 后部
steering ['stiəriŋ]	n. 转向装置
manual ['mænjuəl]	adj. 手动操作的; n. 手册
transmission [trænz'mɪʃən]	n. 传动装置, 变速器
ratio ['reɪʃiəu]	n. 比率; 传动比
neutral ['nju:trəl]	adj. 空挡的
reverse [ri've:s]	adj. 相反的, 反向的
automatic [ɔ:tə'mætɪk]	adj. 自动的
automatically [ɔ:tə'mætɪklɪ]	adv. 自动地
final drive	主减速器
speed-reduction	减速装置
differential [ˌdɪfə'renʃəl]	n. 差速器
axle ['æksl]	n. 轴, 车桥
torque [tɔ:k]	n. 力矩
electronic fuel injection	电子燃油喷射
spark [spɑ:k]	n. 火花
timing ['taɪmɪŋ]	n. (点火、喷油等)正时
emission [i'mɪʃən]	n. 排放

NOTES TO THE TEXT

1. Most automotive engines are located at the front of the vehicle and drive the rear wheels through a power train made up of gears, shafts, and other mechanical and hydraulic components.

译文: 大多数汽车发动机位于汽车的前部, 通过传动系驱动车轮, 动力传动系是由齿轮、轴和其他的机械与液压元件组成的。

注释: made up of 为过去式分词, 修饰 power train。

2. The automobile body is the assembly of sheet-metal, plastic or composite material panels together with windows, doors, seats, upholstery and other parts.

译文: 汽车车身是由薄钢板、塑料或合成材料构成的, 并且是带有车窗、车门、座椅、汽车内饰和其他部件的装配体。

3. The suspension supports the weight of the vehicle, absorbs road shocks, transmits

brake-reaction forces, helps maintain traction between the tires and the road.

译文：悬架支撑车体重量，吸收来自路面的冲击，传送制动作用力，从而有助于维持轮胎和路面之间的牵引力。

注释：此句采用并列谓语。

4. The steering system enables the driver to turn the front wheels left or right to control the direction of vehicle travel.

译文：转向系统使驾驶人以前轮向左或右转来控制汽车行驶的方向。

注释：enable sb to do 意思为“某人可以干某事”。

5. The transmission is the device in the power train that provides different forward gear ratios between the engine and drive wheels, as well as neutral and reverse.

译文：传动系中变速器的作用是在发动机和驱动轮之间的前进挡中提供不同的传动比，同时也有空挡和倒挡。

注释：that 从句修饰 the device。

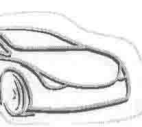
6. The differential is the gear assembly between axle shafts that permits one wheel to rotate at a speed different from that of the other (if necessary), while transmitting torque from the final-drive ring gear to the axle shafts.

译文：差速器是车轮与半轴之间的齿轮总成，当把主传动环形齿轮的扭矩传送给车轮半轴时，它允许内、外车轮以不同的速度旋转(如果必要的话)。

EXERCISES

1. Translate the following expressions into Chinese.

automatic	
final drive	
automobile	
automotive	
frame	
axle	
body	
brake-reaction force	
manual	
chassis	
panel	
combustion	
power	
cylinder	
diesel	



(续)

differential	
electronic fuel injection	
emission	
engine	

2. Translate the following expressions into English.

传动系	
比率；传动比	
后部	
相反的，反向的	
刚硬的	
轴	
火花	
减速装置	
弹簧	
转向装置	
冲程	
悬挂	
(点火、喷油等)正时	
轮胎	
力矩	
机械学的	
驱动力	
传动装置，变速器	
车辆	

3. Read each statement below and indicate if it is true (T) or false (F) according to your understanding of the text, and then translate the true sentences.

(1) The suspension supports the weight of the vehicle, absorbs road shocks, transmits brake-reaction forces. ()

(2) The steering system enables the driver to turn the rear wheels to control the direction of most vehicle travel. ()

(3) A brake is a device that uses a uncontrolled force to reduce the speed of or stop a moving vehicle. ()

(4) The engine supplies the power to move the vehicle. ()

- (5) V-type 12-cylinder engine are the most widely used today. ()
- (6) Most automotive engines today have electronic fuel injection instead of a carburetor. ()
- (7) The final drive is the speed-reduction gear set that drives the differential. ()

READING MATERIAL

History of the Automobile

The history of the automobile begins as early as 1769, with the creation of steam-powered automobiles capable of human transport. Steam-powered self-propelled vehicles are thought to have been devised in the late 18th century. German engineer Karl Benz, inventor of numerous car-related technologies, is generally regarded as the inventor of the modern automobile. Karl Benz built his first automobile in 1885 in Mannheim (as Fig.1.2 shows). Benz was granted a patent for his automobile on 29 January 1886, and began the first production of automobiles in 1888.

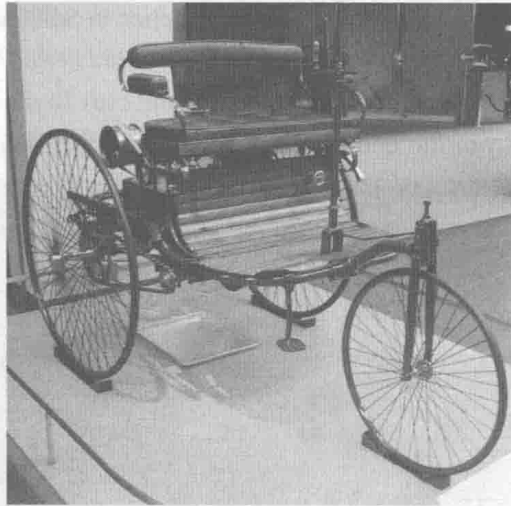


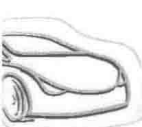
Fig.1.2 The 1885-built Benz Patent Motorwagen

Veteran Car Era

By 1900, mass production of automobiles had begun in France and the United States. Innovation was rapid and rampant, with no clear standards for basic vehicle architectures, body styles, construction materials, or controls. Major breakthroughs in proving the usefulness of the automobile came with the historic long-distance drive of Bertha Benz in 1888, when she traveled more than 80 kilometres (50 mi) from Mannheim to Pforzheim, to make people aware of the potential of the vehicles her husband, Karl Benz, manufactured.

Edwardian Era

Edwardian era lasted from roughly 1905 through to the beginning of World War I in 1914.



The most popular car is shown as (as Fig.1.3 shows) Key developments included electric ignition system (by Robert Bosch, 1903), independent suspension, and four-wheel brakes (by the Arrol-Johnston Company of Scotland in 1909).

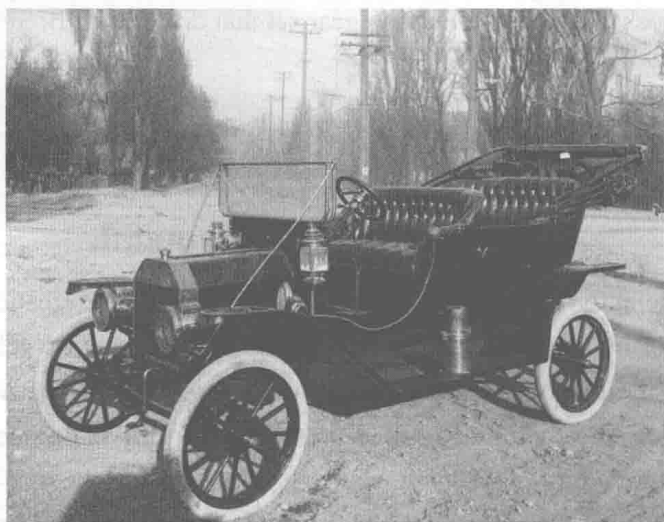


Fig.1.3 The 1910 Model T, Photographed in Salt Lake City



Vintage Era

The vintage era lasted from the end of World War I (1919), The most popular car is shown as Fig.1.4 through the Wall Street Crash at the end of 1929. During this period, the front-engined car came to dominate, with closed bodies and standardised controls becoming the norm. Development of the internal combustion engine continued at a rapid pace, with multi-valve and overhead camshaft engines produced at the high end.

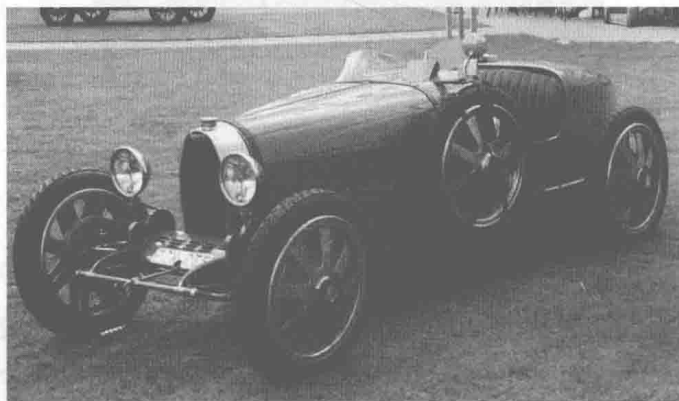


Fig.1.4 Bugatti Type 35A Grand Prix Racer 1925



Pre-WWII Era

The pre-war era began with the Great Depression in 1930, and ended at 1948. The most popular car is shown as Fig.1.5 By the 1930s, most of the mechanical technology used in today's automobiles had been invented.