全国高等农业院校试用教材

英 语

北京农业机械化学院主编

农业机械化专业用

农业出版社

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编 者 说 明

本书是供高等农业院校农业机械化专业学生在学完180学时的基础英语之后使用的提高阶段英语教材。教学总时数为60。本阶段的主要任务在于加深和巩固基础英语阶段所学到的语言知识，提高对所学知识的运用熟巧与阅读、翻译能力。

本书有分析读物十二课（其中十课为必读，两课为机动），约二万二千印符，综合读物二十四课，约三万三千印符。分析读物中出现的生词和词组为五百四十二个（包括两篇机动课文的生词），综合读物没有单排词汇表，其中出现的生词和词组一并列入书末总词汇表。

课文全部选自与本专业有关的科普或科技原文，既有一般的专业基础知识的小品，也有介绍拖拉机、农机常识的浅显文章。全书文章内容力求通俗易懂，但又要有一定的先进性。有些文章选自较新的原文杂志，反映的内容比较新颖，但可能不够成熟，望读者使用时注意。

课文注释部分除了对难理解的短语、句子进行必要的注释之外，还对常用的词、词组或句型作了较为详尽的例解，以便学生理解掌握。

练习部分，除复习课文的练习之外，还配有复习基础语法的练习。

书末附有"英译汉中的几个问题"，本材料并不是全面地介绍翻译技巧，而是重点讲解几个学生在英译汉中较难理解、容易出错的问题。

由于编者水平有限，加之时间仓促，缺点和错误一定不少，希望使用本书的同志们批评指正，以便我们修改。

参加本书编写工作的有：北京农业机械化学院陶立三（主编）、浙江农业大学文镇球（副主编）、河北农业大学梁一雄、西北农学院杨希正；还有段其煌、戴维珍参加了第一、二、四课的部分编写工作。

参加审阅的有：山西农学院郭南洲、沈阳农学院马玉琴、山东农业机械化学院俞鸣玮、安徽农学院沈航青、湖南农学院王立仁、广西农学院孔繁诚、西南农学院甘斗南、黑龙江农垦大学徐越然、甘肃农业大学杨俊卿、河南农学院张纪彰、浙江农业大学陈原真、崔绍荣和华北农业机械化学院左润之。

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编　者

一九七八年十月

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CONTENTS

LESSON ONE

POWER

Power is the rate of doing work and may be measured in units which we call watts (W); one watt being a rate of work equivalent to one newton-metre (Nm) or joule (J) per second (S). Our cars and tractors are often classified on their power, e. g. a medium power tractor is one which is capable of producing 25 to 35 KW. This power rating given to a tractor is the brake power, and it is measured when the tractor is stationary by driving, directly from the engine, a machine designed to measure power (absorption dynamometer). The watt as a unit of power replaces the old unit of horse-power. One horse-power is equivalent to 746 W and to convert horse-power rating to watts the horse-power should be multiplied by 746.

Brake power, therefore, indicates the capacity of an engine to produce work. Under field conditions, not all this power will be available to pull implements, because some of it is needed to propel the tractor forward and overcome the resistance of the bearings and the soil on the wheels of the tractor. To take an example of a 40 KW tractor moving across a field at about 3 km/h, it may take about 5 KW to move the tractor, leaving 35 KW to pull an implement. This power available to haul an implement is called drawbar power. Many of our implements

such as forage harvesters are driven by the tractor through the power take-off shaft (p. t. o.). Therefore, in addition to pulling the implement, some of the available power is needed to drive it as well. When a stationary machine is being driven from the p. t. o., all the power — apart from that lost through friction in the transmission — is available for driving the machine.

The more easily a tractor can move itself along, for instance on a hard surface, the more drawbar power will be available. On heavy wet land much power is absorbed in moving the tractor, leaving less power available at the drawbar. This is why heavy-land farmers need higher-powered tractors than light-land farmers.

(from "Farm Machinery" by A. G. Harris)

NEW WORDS AND EXPRESSIONS

1. rate [reit] n. 比例，比率
2. measure ['meʒə] vt. 计量，测量； n. 尺寸，度量的单位
    measure ... in ... 按……计量
3. unit ['ju:nit] n. 单位
4. watt [wɔt] n. (abbr. W) 瓦特，瓦
5. equivalent [i'kwivələnt] a. 相等的，等量的；n. 相等物
6. newton-metre ['nju:tn 'mi:tə] (abbr. Nm) 牛顿·米
7. joule [dʒəul; dʒu:l] (abbr. J) 焦耳（热量、能量和功的单位）
8. per [pə:] prep. 每
9. classify ['klæsifai] vt. 分类；分级；分等
    to be classified on ... 根据……而分类
10. e. g. [.i:'dʒi:; fər ig'za:mpl] 例如

11. capable ['keipəbl] a. 有能力的；能……的

      to be capable of 能……的

12. KW ['kiləwɔt] 千瓦

13. rating ['reitiŋ] n. 定额，评定，分等

14. brake power [breik 'pauə] 制动功率

15. stationary ['steiʃnəri] a. 固定的，静止的，不动的

16. drive [draiv] vt. 驾驶；驱动

17. directly [di'rektli] ad. 直接地

18. absorption [əb'sɔ:pʃn] n. 吸收，吸收作用

19. dynamometer [dainə'mɔmitə] n. 测力计，测功计

      absorption dynamometer 阻尼测功计

20. replace [ri'pleis] vt. 取代，替换；放回

21. horse-power (abbr. hp.) 马力

22. convert [kən'və:t] vt. 转变，变为

      convert ... to (into) ... 把……转化为

23. multiply ['mʌltiplai] vt. 使相乘；增加

      multiply ... by ... 将……乘以……

      to be multiplied by ... 被乘以……

24. indicate ['indikeit] vt. 指示，指出

25. capacity [kə'pæsiti] n. 容量；能力

26. available [ə'veiləbl] a. 有用的，可利用的；可得到的

27. propel [prə'pel] vt. 推进

28. resistance [ri'zistəns] n. 阻力

29. bearing ['beəriŋ] n. 轴承

30. take an example of 以……为例

31. km/h 千米/小时

32. haul [hɔ:l] vt. 牵，拖，曳

33. drawbar ['drɔ:bɑ:] n. 牵引杆

34. such as [sʌtʃ æz] 例如

35. forage ['fɔridʒ] n. 饲料

      forage harvester 饲料收获机

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36. power take-off shaft　(abbr. p. t. o.)　动力输出轴

37. in addition to [in ə'diʃn tu]　除……外（还有）；又……

38. as well [æz wel]　（同样）也，还

39. apart from [ə'pɑːt frəm]　除去，撇开，且莫说

40. friction ['frikʃn] n.　摩擦

41. transmission [trænz'miʃn] n.　传动装置；传递

42. absorb [əb'sɔːb] vt.　吸收

43. heavy-land ['hevi lænd]　重土的（粘重土的）

44. light-land ['lait lænd]　轻土的（松软土的）

NOTES TO THE TEXT

1. Power is the rate of doing work and may be measured in units which we call watts (W); one watt being a rate of work equivalent to one newton-metre (Nm) or joule (J) per second (S).

   功率是做功的比率，可用我们称作瓦特的单位来计量；瓦特是功率单位，1瓦特等于1牛顿·米/秒 (Nm/s) 或1焦耳/秒 (J/S)。

   1) which we call watts: 由关系代词 which 引导的定语从句，修饰主句中的 units; which 在从句中作 call 的宾语，watts (W) 作宾语补足语。

   2) one watt being a rate of work: 带有逻辑主语的分词结构，称为独立分词结构，在句中作状语用，表示附加说明。

   3) equivalent to one newton-metre (Nm) or joule (J) per second (S): 后置定语，修饰 a rate of work.

2. This power rating given to a tractor is the brake power, and it is measured when the tractor is stationary by driving, directly from the engine, a machine designed to measure power (absorption dynamometer).

   拖拉机的这种额定功率称为制动功率，其测定方法如下：让拖拉机固定不动，用发动机直接驱动用来测功的专门机械（阻尼式测功计）即可。

这是一个由 and 连接的并列句。 and 以前是一个简单句，其中 given to a tractor 是分词短语作定语用，说明 power rating; and 以后是一个（主从）复合句，其中 when the tractor is stationary 为时间状语从句，其余部分为主句，主句中的谓语为 is measured; by driving a machine 是介词短语，在此作方式状语，说明 is measured; designed to measure power 是分词短语，说明 machine。

3.　. . . . all the power — apart from that lost through friction in the transmission — is available for driving the machine.

　　如果不考虑传动系中因摩擦损失的功率，全部功率都可用来驱动机具。

　　lost through friction in the transmission 为过去分词短语，修饰 that (代表 power)。

EXERCISES

1.　Read aloud the first paragraph of the text.
2.　Translate the following from Chinese into English, or *vice versa*:
　　1)　例如
　　2)　除……以外（还有……）
　　3)　以……为例
　　4)　动力输出轴
　　5)　制动功率
　　6)　牵引功率
　　7)　be capable of producing 50 tractors per day
　　8)　convert horsepower rating to watts
　　9)　multiply five by eight
　　10)　rate of work
　　11)　a machine designed to measure power
　　12)　take an example of a 40 KW tractor
　　13)　propel the tractor forward
　　14)　through the PTO shaft

15) move at about 3km/h

3. Translate the following sentences into Chinese:

1) Since energy is defined as capacity to do work, we measure energy in units of work.

2) The units of power ordinarily used in America are the foot-pound per second, the foot-pound per minute, and the horse-power.

3) Any simple machine is capable of transmitting work done upon it to some other body.

4) The energy possessed by a body, such as tractor, due to its motion, is termed kinetic energy.

5) While part of the heat can be converted back to mechanical work, it is never possible to recover all of it.

6) They have one hour to read newspapers apart from their ordinary work.

7) Many of our implements such as forage harvesters are driven by the tractor through the power take-off shaft. Therefore, in addition to pulling the implement, some of the available power is needed to drive it as well.

8) To calculate the amount of work done, we multiply the force by the distance.

9) In order to measure fully the performance of a tractor we must know the following: the force which a tractor can exert and the distance which it can pull its load in a given time.

10) In case the speed of the machine driven by the engine is much lower than that of the engine, an intermediate shaft must be used.

4. Translate the following sentences into English:

1) 功率是做功的比率，它可以用瓦特来计量。

2) 拖拉机的额定功率称为制动功率。

3) 许多农业机器是由拖拉机通过动力输出轴来驱动的。

4) 在田间作业条件下，拖拉机的一部分功率需要用来驱动拖拉机前

进以及克服齿轮的和土壤对拖拉机轮胎的阻力。

5. Point out the mood of finite verbs used in the following sentences and then translate the sentences into Chinese:

   1) We could not have done the work well without the peasants' help.

   2) The vehicle (车辆) could not even be started if it were not for the friction exerted between the tires and the road.

   3) Without a people's army the people have nothing.

   4) Let us consider the way a good driver handles a tractor in the field.

   5) If the machine is to be out of use for some months, the belt should be slackened or removed, to prevent it deteriorating (变质) where it is in contact with the pulley.

   6) It is necessary that the problem should be solved immediately.

   7) Long live the Communist Party of China!

   8) I wish I knew how to operate the machine.

   9) The more easily a tractor can move itself along, for instance on a hard surface, the more drawbar power will be available.

   10) One horse-power is equivalent to 746 W and to convert horse-power rating to watts the horse-power should be multiplied by 746.

   11) Think of the power and the machine as a single unit.

   12) Were it not for the leadership of the Party, we could not live a happy life.

6. Translate the following passages:

   Power is the rate of doing work. To determine the power used or transmitted by a machine, the force must be measured, also the distance through which the force acts and the length of time required for the force to act through this distance. The units of power are the foot-pound per second, the foot-pound per minute and the horsepower.

If a body is moved 1 foot per second against a force of 1-pound weight, the rate of work is 1 foot-pound per second. If it moves 1 foot per minute against the same force, the rate is 1 foot-pound per minute.   If it moves so that 33,000 foot-pounds are done each minute, the rate is 1 horsepower.

SUPPLEMENTARY READING

I

POWER AND HORSEPOWER

The measurement of work tells us only how much work has been done; we do not know how long a time has been taken to do it.   Thus in order to measure fully the performance of a tractor we must know the following: the force which a tractor can exert and the distance which it can pull its load in a given time.

Power is measured in horsepower, usually shortened to h. p., and takes into consideration weight, distance and time, thus it is the rate of doing work.   For example, if 75 kilogrammes are moved a distance of 1 metre in 1 second, power has been required to do this.   In this case the equivalent of 1 metric horsepower (75 kilogramme metres/sec)*. If it is possible to continue moving the 75 kg at the same rate for 1 min then the weight could be moved 60 times as far; i. e. 75×60 kilogramme metres of work in 1 min which is 1 metric horsepower.   This will equal 4,500 kilogramme metres per minute and is equivalent to 32,550 ft-lb per min.

In countries where the foot and pound are used to measure weight and distance the horsepower is measured in foot-pounds (ft-lb) per minute, and 1 h. p. is equivalent to 33,000 ft-lb per min.   For example, if a horse could pull a load of 550 lb for a distance of 60 ft in 1 min it would produce 1 h. p. to do so.

The metric horsepower is about one-seventieth less than British h. p. and to convert British h. p. to metric it is necessary to multiply the number of horsepower by 1.014.

The horsepowers of tractors range from about 2 h. p. for small horticultural tractors using single-cylinder engines and controlled by a walking operator* to about 100 h. p. for large tracklaying tractors. Most wheeled farm tractors develop between about 30 and 50 h. p. The horsepower which a tractor develops may be stated in two ways: brake horsepower and drawbar horsepower.

(from "Basic Farm Machinery" by J. M. Shippen)

Notes:

　* In this case the equivalent of 1 metric horsepower (75 kilogramme metres/sec).

　在此情况下，其功率为1公制马力，即75公斤·米/秒。

本句可理解为不完全句，在意义上省略了 it is (it 代表前句中的 power)。

　* ...... using single-cylinder engines and controlled by a walking operator. 这两个分词短语都作定语，修饰 horticultural tractors。

II

FORCE AND WORK

Force. In mechanics a force is the action of one body upon another body which changes or tends to change their relative motions, positions, sizes, or shapes. To describe a force completely three things must be known: (1) its magnitude, (2) its point of application, and (3) its direction. Forces are of several different kinds. The most common force is weight, which is a measure of the pull of gravity on an object. A tension force tends to lengthen a body. An example is a tractor drawbar while pulling a plow. A compression force pushes on an object, as, for example, a column supporting a portion of a hay mow*.