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Г.Г. ДРУКЕР

Агроинженерия. Профессиональное общение на английском языке

Учебное пособие по дисциплине «Иностранный язык (английский)»

Допущено Учебно-методическим объединением вузов по агроинженерному образованию в качестве учебного пособия для студентов высших учебных заведений, обучающихся по специальности 110301 «Механизация сельского хозяйства»

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Пособие содержит оригинальные англоязычные тексты о дизельных двигателях, тракторах и сельскохозяйственных машинах для обработки почвы, посадки и уборки культур. Тексты могут быть использованы на этапе формирования устойчивых навыков чтения специальной литературы. Предлагаются продуктивные методы работы с извлеченной информацией. Включены материалы, обеспечивающие развитие умений профессионального научного и делового общения. Пособие предназначено для работы со студентами специальности 110301 «Механизация сельского хозяйства» (практические занятия, кружки, факультативы), аспирантами.

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ОТ АВТОРА

Данное учебное пособие предназначено в качестве базового для занятий со студентами специальности 110301 «Механизация сельского хозяйства» после прохождения ими первого этапа обучения иностранному языку.

Цель пособия обусловлена конечными требованиями к владению иностранным языком после завершения второго этапа обучения, предусматривающими наличие у студентов коммуникативной компетенции, необходимой для иноязычной деятельности по изучению зарубежного опыта в профилирующей области знания, а также научного и делового профессионального общения как в устной, так и в письменной форме.

Материалы пособия в основном взяты из современных английских и американских источников и сохраняют особенности соответствующих литературных жанров. Отдельные специальные тексты подвергнуты некоторому сокращению. Пособие содержит три части и приложение.

Тематика текстов, отобранных для части I “Professional English”, определяется ее актуальностью, познавательной ценностью информации и соответствует интересам студентов младших курсов технических факультетов аграрных вузов (специальность 110301). Часть I включает разделы «Diesel Engines», “Farm Tractors” и “Farm Machinery”. Раздел 1 “Diesel Engines” состоит из 12 уроков, система заданий которых дает возможность применения алгоритма чтения общенаучных текстов (в пределах всех его видов), освоенного студентами на первом этапе обучения, при чтении узкоспециальных текстов, способствует более полному раскрытию мыслительного и творческого потенциала студентов, развивая языковую догадку и умение делать логически обоснованный прогноз вероятной информации текста, обучает различным формам устного и письменного (аннотация) воспроизведения текста,

стимулирует продуктивную устную речь. Раздел I завершается англо-русским терминологическим словарем (English-Russian Vocabulary of Special Terms), который значительно упрощает домашнюю подготовку к практическим аудиторным занятиям, ни в коей мере не исключая использования централизованных словарей (English-Russian Dictionaries). Термины, внесенные в «Vocabulary», определенно пополнят активный словарь студентов.

Тексты разделов 2 «Farm Tractors» и 3 «Farm Machinery» предназначены для внеаудиторной самостоятельной работы студентов и предлагают информацию о сельскохозяйственных тракторах и машинах, приводимых в движение дизельным двигателем, то есть непосредственно соотносятся с материалом раздела 1. Тексты раздела 2 вводят студентов в чарующий (по выражению автора большинства этих текстов Майкла Уильямса) мир тракторов: история тракторостроения, всемирноизвестные производители тракторов и их лучшие модели, настоящее и будущее механизации сельского хозяйства. Раздел 3 представляет тексты, описывающие и, в какой-то степени, рекламирующие новейшие модели сельскохозяйственных машин, выпускаемые ведущими в этой отрасли производства компаниями “Case IH”, “New Holland” и “John Deere”.

Комплекс заданий разделов 2 и 3 рассчитан на дальнейшее совершенствование умений всех видов чтения, а также умений выполнять декодирование и интерпретацию текстов на уровнях аннотирования и реферирования с определением ключевых элементов текста и репрезентацией их иерархической структуры. Характер заданий не препятствуют их варьированию и позволяет индивидуализировать самостоятельную работу студентов, важной составляющей которой является работа с терминологической лексикой, когда основной упор должен быть сделан на использование накопленного активного и пассивного словаря, усвоенных способов терми-

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Учебное пособие

Галина Григорьевна Друкер

нообразования, контекста, фоновых знаний, различных централизованных словарей.

Задача части II ”Scientific English” – помочь студентам (в некоторых случаях и аспирантам) в овладении искусством профессионального общения в ходе организации и проведения научной конференции. Основным источником информации для части II послужили материалы CIGR (International Commission of Agricultural Engineering). Задания этой части предполагают освоение соответствующей лексики, активизируют употребление разговорных формул и речевых клише, обучают написанию деловых и личных писем, тезисов, докладов, выступлений, а также формам участия в обсуждении тематики и итоговой дискуссии, обеспечивают готовность к возможной коммуникации на английском языке. Окончательное закрепление полученных знаний осуществляется в виде ролевой игры, моделирующей реальную ситуацию общения.

Часть III “Business English” объединяет три раздела: “Making a Career” (1), “Using the Computer” (2) и “Going Through Border and Customs Formalities (for a Business Trip)” (3). Назначение разделов 1 и 3 – научить адекватно ориентироваться в некоторых конкретных реалиях сегодняшнего дня, связанных с деловой активностью учащихся, для которых уже в студенческие годы или в годы обучения в аспирантуре вполне доступной становится возможность работы, стажировки или учебы за рубежом. Материалы раздела 1 посвящены заполнению и составлению таких официальных документов как запрос / сопроводительное письмо и резюме, рекомендациям того, что надо и не надо делать и говорить в беседе с представителями фирмы потенциальных работодателей. Ролевая игра-модель заканчивает раздел 1. Навыки, приобретенные в результате изучения раздела 3 безусловно помогут свободно пройти таможенный и паспортный контроль при въезде в одну из англоговорящих стран. Материалы раздела 2 “ Using the Computer ”, почерпнутые из глубин электронных

средств массовой информации, рассказывают о людях, открывших компьютерную эру, и тех, чьи имена связаны с ней в наше время. Сведения об аппаратном обеспечении, программном обеспечении, операционных системах и другие технические данные, а также англоязычные специальные термины и их русские эквиваленты, вне всякого сомнения, окажутся весьма полезными в функционировании специалиста любого профиля.

В Приложении находится информация, облегчающая чтение английской научно-технической литературы (уже известная студентам первого этапа обучения и распространенная применительно к узкоспециальным текстам), и информация о содержательных и структурных особенностях текста, владение которой является надежной основой грамотного составления обучаемыми собственных речевых произведений.

В заключении следует отметить, что в целом пособие стимулирует интеллектуальное и эмоциональное развитие личности студентов, повышает уровень их общей культуры и образования, создает благоприятные условия реализации учебного процесса с учетом его социокультурного аспекта.

Структура пособия не ограничивает творческий поиск преподавателя и допускает использование методов обучения, приемлемых в ее рамках.

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PART I
PROFESSIONAL ENGLISH

UNIT 1
DIESEL ENGINES

This Unit is designed to teach the principles of diesel engine operation and basic engine servicing.

A general knowledge of engines (especially diesel engines) is very helpful to the students of farm mechanization departments who on graduating from a University will be offered diversified job opportunities and potential for advancement as part of the ongoing business and expansion of companies that develop, sell and service small diesel-powered equipment such as lawn and garden tractors or large equipment such as heavy agricultural tractors and machinery.

Career opportunities may be found in the operation of diesel-powered equipment, in the service and repair of diesel engines employed both in agriculture and industry. You may be also interested in a position teaching diesel science technology at a vocational college. Teaching and conducting research for a major University or large industrial corporation may be appealing, too.

LESSON 1

Task 1

Read the title of Text 1 and say what it is about.

Task 2

Think and say why the engine mentioned in the title of the text is called by the name “diesel”.

Task 3

Tell everything you know about the history of diesel

engines.

Task 4

Read Text 1 using the Vocabulary and a dictionary. Say what information is quite new to you.

Text 1

FROM THE HISTORY OF DIESEL ENGINES

In 1892 Rudolph Diesel was issued a German patent for an engine that would burn coal dust and, as an added benefit, eliminate a useless by-product of mining. His third attempt built in 1895 was successful; this engine had a compression pressure of 450 pounds per square inch, and the fuel was injected by highly pressurized air. The diesel engine was born.

Robert Bosch, another name still associated with diesel fuel injection, developed the first mass-produced injection pump in 1927. The idea was developed further until at the present time licenses have been granted to injector pump manufacturing companies in the United States, Australia, South America, India, Japan and Spain.

From the ideas and designs of these pioneers today many companies worldwide manufacture diesel-powered equipment.

Diesel engines play a major role, directly or indirectly, in many industries. Diesel engines are being used in thousands of applications, including on-and off-highway trucking, forest harvesting and construction equipment, marine equipment, electric power generation and agricultural production.

Knowledge and training in the field of diesel engines open a broad range of career opportunities to the persons interested in diversified work experience, future promotion and world travel. The field of diesel power is in constant need of technically qualified workers.

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Task 5

Read the text again and be ready to answer these questions:

1. When and where was Rudolph Diesel issued a patent for his engine?

2. What attempt to originate the engine was really successful?

3. What can you tell about Robert Bosch in association with diesel engines?

4. What application of diesel engines is more interesting to you? Why?

5. What are the reasons for the importance of knowledge and training in the field of diesel engines?

Task 6

Write a summary of the text in Russian.

Task 7

Comment on the following words by Rudolph Diesel: "Изобретатель несет в себе тот священный факел, который осветит будущее**". Do it both in Russian and in English**.

Task 8

a) Read Text 2 and try to understand its main contents.

Text 2

The engine is the source of power that makes the wheels go around and the car move. It is usually referred to as an internal combustion engine because gasoline is burned within its cylinders or combustion chambers. The first successful internal combustion engine was built by Etienne Lenoir in 1860. The fuel used was illuminating gas. Liquid fuels such as petrol, alcohol, paraffin, turpentine or even heavy oil may be used too. But they must be va-

porized by a special device known as a carburetor.

In 1876 the German engineer N.Otto introduced the engine operating on the four-stroke cycle, usually referred to as the Otto cycle. Four-stroke engines are commonly used in different units.

b) Read the text once again and test your reading comprehension by choosing the correct statements:

1. Etienne Lenoir originated in Germany and obtained patents on high-compression engine.
2. Etienne Lenoir was the first to build the internal combustion engine.
3. Gasoline is burned within the cylinders or combustion chambers.
4. Liquid fuels must not be vaporized for burning in the cylinders.
5. The Otto cycle is named after Dr.N.Otto.

c) Title the text.

Task 9

Give the English equivalents of the special terms used in Texts 1 and 2. Memorize them:

Двигатель, двигатель внутреннего сгорания, давление, сжатие, топливо, воздух, впрыскивание, топливной насос, мощность, бензин, колесо, камера сгорания, цилиндр, масло, механизм (прибор, устройство), ход (длина хода поршня, такт), цикл, агрегат (узел); сжигать, разрабатывать (конструировать), производить, двигать(ся), испарять(ся), работать, использовать.

Task 10

Write a summary of Text 2 in Russian.

Первые достаточно полно излагают все основные положения, доказательства и выводы. Вторые перечисляют лишь главные положения и выводы по ним без изложения доказательств.

Оба вида рефератов могут быть монографическими, составленными на основании одного источника; сводными, излагающими содержание нескольких источников, объединенных общей темой, и обзорными, излагающими результат обзора многих источников по определенной тематике, плану.

12. СВЯЗНОСТЬ ТЕКСТА

Предложения в тексте связаны общим смысловым содержанием, общей темой текста. Очень часто связность достигается благодаря различным специальным средствам. К наиболее распространенным относятся повторение одного и того же ключевого слова и замена его местоимениями.

Часто взаимосвязь предложений в тексте достигается с помощью наречий, местоименных наречий, которые употребляются вместо членов предложения для уточнения времени и места развития событий, о которых сообщалось в предыдущем предложении.

Одним из специальных средств связности является порядок слов в предложении. Для обозначения тесной смысловой связи в тексте предложение может начинаться словом или словосочетанием из предыдущего предложения.

БИБЛИОГРАФИЧЕСКИЙ СПИСОК

1. Williams M. Farm Tractors. - Silverdale Books. Registered Number 2372865 Desford Road Enderby Leicester

его создания, страницы.

11. РЕФЕРАТ

Реферат (a precis) – сжатое изложение основного содержания первичного оригинального документа – текста (статьи, главы, целой книги, монографии, брошюры, патента) по всем затронутым в нем вопросам, полученные в результате его смысловой обработки (вторичный текст).

Основным назначением реферата является оперативное распространение важнейшей научно-технической информации в максимально сжатом виде и ее использование читателями различных категорий.

Реферат имеет свою структуру:

а) Предметная рубрика: наименование области или раздела знаний, к которым относится реферируемый документ;

б) Тема: более узкая предметная отнесенность источника или ряда источников;

в) Выходные данные источника, или совокупность источников на иностранном и русском языках: фамилия и инициалы автора, заглавие, издательство, место, год издания (для журнала – название и номер);

г) Главная мысль, идея реферируемого материала: реферат сжато формулирует главную мысль, не внося в нее своих комментариев, даже если она в тексте автором лишь подразумевается;

д) Изложение содержания: содержание реферируемого материала излагается в последовательности, в которой он приводится в источнике.

е) Комментарий, примечание реферата: это чаще всего указание адресата, на которого рассчитан реферируемый материал.

Рефераты делятся на а) информативные, или рефераты-конспекты, и б) индикативные, или рефераты-резюме. Пер-

LESSON 2

Task 1

Look through Text 1 and say what the main topics of the text are.

Text 1

WHY USE DIESEL ENGINES

The development and improvement of diesel engines began in Europe during the middle and late 1800s. Diesel engines were used as low-speed, high-power engines for power plant and marine uses until 1940 when interest turned to increasing the speed and efficiency of these engines.

Today diesel engines are used to provide power in a wide variety of applications in many industries: transportation, construction, forestry, marine electrical generating plants and, first of all, agriculture – tractors, forage choppers, combine harvesters, hay-processing equipment, farm trucks and irrigation pumps.

Diesel engines are widely used because they have many advantages:

- Diesel engines are very efficient producing more power from the fuel that is burned. This makes them more economical to operate.
- The fuel vapor in diesels engines is not explosive and diesel exhaust gases are less poisonous than those produced by gasoline engines because they contain less carbon dioxide.
- Diesel engines have greater lugging power and torque and, as a result, lose less power than gasoline engines when engine speed is reduced under a heavy load.
- These engines are durable and maintain their economy. If cared for properly they will continue to operate for a long time.
- Diesel fuel is less volatile than gasoline, and diesel engines are not affected by vapor lock.
- Diesel engines use a variety of fuels. Many alternate fu-

els and fuel mixtures can be used successfully in diesel engines.

But diesel engines also have certain disadvantages, and they should be mentioned too: diesel engines must be stronger and heavier than gasoline engines to withstand higher compression; they are initially more expensive; in colder climates correct fuel must be used not to gel during cold weather; some diesel engines are noisier than gasoline engines, and their pungent exhaust ordor is offensive to some operators.

Task 2

Find the Russian equivalents of the special terms used in the text.

Memorize the terms:

Low-speed engines, high-speed engines, efficiency, tractor, forage chopper, combine harvester, hay-processing equipment, farm truck, irrigation pump, fuel vapor, explosive, exhaust gases, lugging power, torque, load, durable, to maintain, volatile, vapor lock, fuel mixture, to gel.

Task 3

Read the text using the Vocabulary and a dictionary. Be ready to do the following tasks:

a) Find the passages describing the uses and disadvantages of diesel engines and translate them into Russian.

b) Find the sentences with the Infinitive and translate them into Russian in writing.

c) Find and write out the key words to speak about the advantages of diesel engines.

d) Speak about the advantages of diesel engines. Do it in pairs. Thoroughly think over your questions and answers.

Task 4

Read Text 2 to find answers to the given questions:

1. What kinds of engines are mentioned in the text?

тексте, а в какой-либо иной логической связи. Часть текстов может записываться в виде цитат.

8. АННОТАЦИЯ

Аннотация (an annotation) – предельно сжатое изложение главного содержания текста. Основным отличием аннотации от реферата является то, что реферат дает представление о содержании оригинала, а аннотация – только о его тематике. Аннотация перечисляет, называет вопросы, проблемы оригинала, но не раскрывает их.

Для аннотации характерно использование специальных оборотов, клише.

9. СТРУКТУРА АННОТАЦИИ

а) Предметная рубрика. В этом пункте называется область или раздел знания, к которому относится аннотируемый материал.

б) Тема.

в) Выходные данные.

г) Содержание аннотации.

10. КРАТКОЕ ИЗЛОЖЕНИЕ (КОНСПЕКТ)

Конспект (a summary) – систематическая, логически связанная запись содержания читаемого материала, объединяющая план, выписки, тезисы или хотя бы два из этих типов записи.

В отличии от выписок и тезисов конспект раскрывает содержание в той последовательности изложения, в котором оно предлагается в читаемом источнике.

Для составления конспекта отбирается самая важная и существенная информация. Главные положения выделяются, важные слова или словосочетания подчеркиваются. Каждая новая мысль начинается с новой строки. В конспекте следует указывать фамилию автора, название источника, место, время

зволяет быстро ориентироваться в тексте, находить необходимую информацию, воспринимать и усваивать смысл целой фразы, абзаца, текста в процессе чтения.

5. СИСТЕМА ЯЗЫКОВЫХ СРЕДСТВ ТЕКСТА

Текст содержит систему языковых средств, функционирующую в связанных между собой предложениях данного текста.

Решающее значение для установления предмета сообщения и того, что о нем рассказывается, имеют языковые средства, выражающие подлежащее и сказуемое. Все остальные члены предложения расширяют, дополняют, характеризуют информацию, сообщенную главными членами предложения.

6. ВЫПИСКИ

Выписки (extracts) – наиболее распространенный вид работы над учебной или научной литературой. Они фиксируют для дальнейшего использования нужные, важные места из учебника, книги, журнальной статьи, брошюры и т.п. Обычно выписывают отдельные положения, факты, цифровой, другой фактический или иллюстративный материал.

7. ТЕЗИСЫ

Тезисы (an abstract) – вид записи при чтении, позволяющий обобщить материал, изложить его суть в кратких формулировках, раскрывающих все произведение (статью, доклад, главу и т.п.). В отличие от конспекта они дают возможность раскрыть содержание читаемого материала независимо от последовательности его изложения в тексте.

Тезисы могут быть простыми и краткими (включать только основные положения), а также сложными и полными (включать, кроме основных, второстепенные положения). Они должны вытекать один из другого. Некоторые положе-

2. What were the reasons for inventing a more efficient engine than the steam engine?
3. Who was the first to make the internal combustion engine really popular?
4. Why did diesel-engined units become general?

Text 2

DIFFERENT KINDS OF ENGINES

In Washington the story is told of a director of the Patent Office who in the early thirties of the last century suggested that the office be closed because “everything that could possibly be invented had been invented”. People experienced a similar feeling after the invention of the steam engine in 1763.

But there was a great need for a more efficient engine than the steam engine, for one without a huge boiler, an engine that could quickly be started and stopped. This problem was solved by the invention of the internal combustion engine (gasoline engine). The person who was the first to make it really popular was Henry Ford, an American manufacturer who introduced the first cheap motor car, the famous Ford Model “T”.

The rapid development of the internal combustion engine led to its use in the farm tractors, thereby creating a revolution in agriculture. The use of motor vehicles for carrying heavy loads developed more slowly until the 1930s when diesel-engined units became general thanks to the actual advantages of diesel engines.

Task 5

Write a summary of the text in Russian.

LESSON 3

Task 1

Find the meaning of the following words and word combinations used in the text. Memorize them:

Compression ignition, spark-ignition, injector nozzles, ignition system, spark plug, coil, magneto, distributor, ignition wiring, to draw in, intake stroke, ratio, high-pressure pump, to spray, horsepower, throttle, to shut off, injection pump governor.

Task 2

Read the title of the text and say what the two types of internal combustion engines are.

Text

IDENTIFYING DIESEL ENGINES: DIFFERENCES BETWEEN DIESEL AND GASOLINE ENGINES

An engine produces power. The internal combustion engine produces power by burning fuel inside a combustion chamber within the engine. This type of engine provides power for automobiles, tractors, motorcycles and many other types of equipment.

The diesel engine is a type of internal combustion engine that produces power by compression-ignition. At first glance these engines may look like spark-ignition engines, but upon closer inspection it is easy to see that they differ in many ways.

Internal combustion engines are classified by their method of ignition: either spark-ignition (gasoline engines) or compression ignition (diesel engines).

There are some major differences between a diesel and a gasoline engine that can be easily observed, first of all, it is the presence of an injection pump and the fuel lines connecting the pump to the injector nozzles in the cylinders (Fig.3.1).

There are some other differences between these two types of engines that should be mentioned too:

- Diesel engines require more air for operation than do other internal combustion engines that run on liquid fuel;
- Unlike gasoline engines, diesel engines have no ignition system, so there are no spark plugs, no coil, magneto, distributor or ignition wiring;

2. ПОДГОТОВКА УСТНОГО СООБЩЕНИЯ НА ТЕМУ

При подготовке устного сообщения намечается и формулируется тема сообщения, определяется его цель, адресат и планируемое время говорения.

После этого составляется смысловой план сообщения и формулируются пункты плана введения, основной части и заключения.

Завершающий этап подготовки сообщения – отбор и запись напротив пунктов плана ключевых слов и словосочетаний.

3. ПЛАН СМЫСЛОВОГО СОДЕРЖАНИЯ

Смысловая структура любого абзаца позволяет выделить в нем основной тезис, который может быть представлен ключевым предложением, словами или словосочетаниями. Эти единицы абзаца передают обобщенно его основное содержание. Другие отрезки текста детализируют основное содержание, примеры, аргументы, цифры и прочие данные, раскрывающие основной тезис.

Ключевые предложения, словосочетания или слова могут использоваться как пункты плана будущего устного сообщения или подачи автором информации в тексте.

Наиболее часто для формулирования пунктов плана используются:

а) именные словосочетания;

б) предложения;

в) вопросы.

4. КЛЮЧЕВЫЕ СЛОВА

Ключевые слова (key words) – это слова, наиболее существенные для раскрытия темы, обозначающие основные понятия в той или иной предметной области. Их знание по-

Обратите внимание, что нет необходимости сразу искать в словаре все незнакомые слова, вначале их можно заменить неопределенными местоимениями и наречиями (какой-то, кого-то, как-то, где-то, куда-то для чего-то и др.).

11. Внимательно присматривайтесь к словам, имеющим знакомые вам корни, приставки, суффиксы. Попытайтесь самостоятельно установить значение этих слов. При этом обращайте внимание на то, какой частью речи являются эти слова, а затем подбирайте соответствующее русской слово. Слова, оставшиеся непонятными, ищите в словаре, соотнося их значение с контекстом.

12. Постоянно помните о логической последовательности рассуждения и следите, чтобы она не нарушалась.

ТЕКСТ: ИНФОРМАЦИЯ К РАЗМЫШЛЕНИЮ

1. СТРУКТУРА ТЕКСТА

Текст в учебнике, статья, доклад, лекция характеризуются наличием трех частей: вступления, основной части, заключения. Это наиболее удачный способ логической организации передаваемой информации.

Вступление помогает читающему или слушающему подготовиться к восприятию основного содержания, увидеть основной тезис, который будет развернут в тексте.

В ***основной части*** излагается ***основное*** содержание. При этом соблюдается строгая логическая организация материала, последовательность в развитии мысли, доказательность положений, связанность всех высказываний в единое смысловое целое. Особое значение для главной части приобретают тезис, аргумент, демонстрация, иллюстрация.

Заключение подводит итог развертыванию главного тезиса, обобщает сказанное, написанное.

- Diesel engines draw in only air on the intake (admission) stroke whereas gasoline engines draw in a mixture of fuel and air;

- A diesel engine compresses the air before the fuel is introduced (Fig. 3.2). In a gasoline engine the fuel is picked up by the air as it passes through the carburetor so that the vaporized fuel is compressed along with the air;

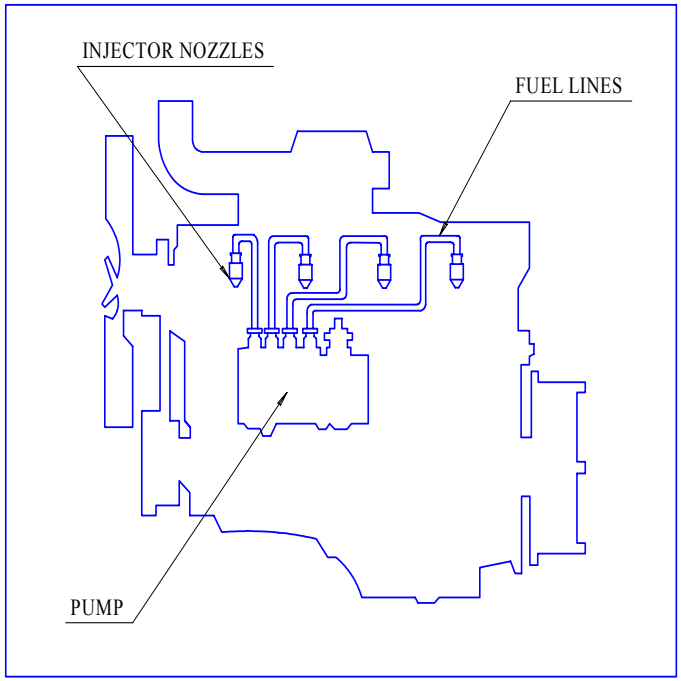


Fig. 3.1. A diesel engine can be identified by the presence of an injection pump, fuel lines, and injection nozzles.

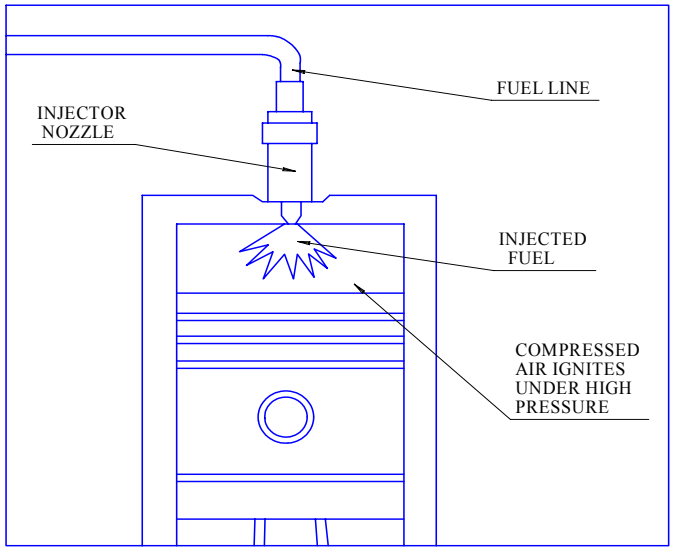


Fig.3.2. The diesel engine compresses the air before the fuel is introduced into the combustion chamber.

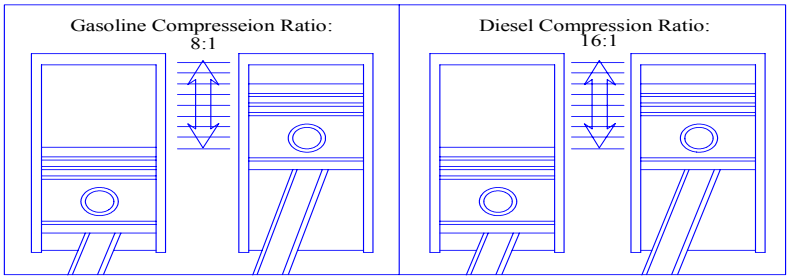


Fig. 3.3. Diesel engines use a greater compression ratio than do gasoline engines.

ла, таким образом, большое значение". Вводное слово в начале предложения обеспечивает логическую связь между этим предложением и предыдущим высказыванием.

6. В каждом отдельном предложении сначала найдите сказуемое или группу сказуемого, затем подлежащее или группу подлежащего. Если значение этих слов неизвестно, следует обратиться к словарю.

7. Помните, что глагол-сказуемое обычно стоит в предложении на втором месте и найти его можно: а) по личным местоимениям; б) по вспомогательным или модальным глаголам в личной форме; в) по суффиксу правильного глагола; г) по форме неправильного глагола.

8. Подлежащее, как правило, стоит слева от сказуемого. Помните, что существительное употребляется в функции подлежащего только без предлога. Обратите внимание, что невозможно достичь грамотного перевода на русский язык с английского, если слепо придерживаться присущего английскому языку твердого порядка слов: ПСД (кто делает что).

9. Найдя подлежащее и сказуемое, проверьте, согласуются ли они в лице или числе. Поняв значение главных членов, выявите последовательно второстепенные, сначала в группе сказуемого, а затем в группе подлежащего, только после этого начинайте работать с остальными членами предложения.

10. Если предложение сложное, то придаточное или придаточные предложения временно опускаются. Если предложение простое распространенное, то следует определить слова и группы слов, которые можно тоже временно опустить для выяснения основного содержания предложения. Чаще всего это обстоятельства (в том числе выраженные наречиями). Это необходимо, так как они нередко разбивают сложные глагольные формы и препятствуют грамматическому анализу. The data are however

ТРУДНЫХ ДЛЯ ПОНИМАНИЯ (ИЛИ ПЕРЕВОДА) ПРЕДЛОЖЕНИЙ ТЕКСТА НА АНГЛИЙСКОМ ЯЗЫКЕ

1. Прочитав заголовок, бегло просмотрите текст и с опорой на фоновые знания, постарайтесь понять, о чем идет речь.

2. При вторичном чтении по внешним признакам определите тип трудного для понимания предложения и функции всех его составляющих.

3. При наличии сложносочиненного предложения разделите его по формальным признакам на самостоятельные и придаточные, выделите инфинитивные, причастные и герундиальные обороты.

4. Если в предложении есть служебные слова, используйте их для членения предложения на смысловые группы.

5. Обратите внимание, что вводные слова и обороты при переводе выносятся вперед, что делает перевод более грамотным.

Наиболее часто встречаются следующие вводные слова: however, therefore, then, again, further, also, now, thus, yet, on the one hand, on the other hand, conversely, alternatively, for example (instance), moreover, in its turn, presumably.

Эти слова часто стоят в середине английского предложения. Вынесение вводного слова в начало предложения при переводе дает возможность контролировать логическое развитие переводимого текста, поскольку эти слова обеспечивают логические связи между отдельными частями высказывания. Например, предложение "The development of a new generation of tractor transmissions was thus of great significance" переводится "Таким образом, разработка нового поколения тракторных трансмиссий имела большое значение", а не "Разработка нового поколения тракторных трансмиссий име-

- Diesel engines use a greater compression ratio than do gasoline engines (Fig.3.3).
- A diesel engine requires a high-pressure pump to inject the fuel into the compressed air in the cylinder;
- Each cylinder in the diesel engine has a fuel injection nozzle or injector that sprays fuel into the hot, compressed air;
- Diesel engines are heavier than are gasoline engines of the same horse-power. Since diesel engines must operate with high cylinder pressure the engines should be constructed with heavier materials to withstand the greater pressure;
- In a diesel engine the throttle control regulates only the fuel. Engine speed is controlled by changing the amount of fuel injected into the compressed air in the cylinder;
- Diesel engines are stopped by shutting off the fuel to the cylinders by a manually operated control or by an electric solenoid which acts on the injection pump governors. Gasoline engines are stopped by cutting off the spark from the spark plugs.

Task 3

Read the text using the Vocabulary and a dictionary and get ready to answer the questions:

1. What is an internal combustion engine?
2. What is a diesel engine?
3. What difference between a diesel engine and a gasoline engine can be easily observed?
4. Why do diesel engines have no spark plugs, no coil, magneto and distributor?
5. When does a diesel engine compress the air?
6. What compression ratio is expected for diesel engines?
7. Why does each cylinder in a diesel engine have a fuel injection nozzle?
8. Why should diesel engines be constructed with heavier materials?

9. How is engine speed controlled in diesel engines?
10. What is the way of stopping a diesel engine?

Task 4

Find in the text the sentences with:

a) the verb "to do" and state its function;
b) the verb "should" and state its function;
c) the Infinitives, state their functions and translate the sentences into Russian in writing.

Task 5

Complete the following sentences using the information of the text:

1. The internal combustion engine produces power….
2. The diesel engine is a type….
3. There are some major differences between a diesel and….
4. Diesel engines require more air ….
5. Unlike gasoline engines, diesel engines have no….
6. A diesel engine compresses the air……
7. Diesel engines use a greater….
8. A diesel engine requires a high-pressure pump….
9. Each cylinder in a diesel engine has….
10. Diesel engines are heavier….
11. Engine speed is controlled….

Task 6

Write an annotation of the text in Russian.

LESSON 4

Task 1

Read Text 1 about the main parts of a diesel engine, write out their names, state their functions and write them down next to the names. Figure 4 below the text will help you

Таможенник: Не за что. Следующий, пожалуйста.

Task 14

Dramatize the dialogues in English.

Task 15

Complete this dialogue and dramatize it:

Officer:
Visitor: Sure, here you are.
Officer:
Visitor: Two weeks. I am on a business trip.
Officer:
Visitor: No, I don't. There are only personal things in my bag. Shall I open it?
Officer:
Visitor: Only two blocks of cigarettes.
Officer:
Visitor: Thank you.

Task 16

Make up your own dialogues. Use the information of the Unit. Work in pairs. You're welcome.

APPENDIX

LEARN, REMEMBER AND USE

НЕКОТОРЫЕ ЭЛЕМЕНТЫ ЛЕКСИКО-ГРАММАТИЧЕСКОГО АНАЛИЗА

3. **Таможенник:** Покажите Ваши вещи, пожалуйста. Это Ваш чемодан, сэр?
Гость: Нет, это не мой. Этот желтый чемодан мой.
Таможенник: Так, понятно. Это частная поездка?
Гость: Нет, я ученый, приехал на конференцию в Пасадену. Мне открыть сумку?
Таможенник: Нет, не нужно. Вы можете проходить.

4. **Таможенник:** Что это?
Гость: Что?
Таможенник: Профессиональная видеокамера. Почему Вы не внесли ее в декларацию?
Гость: Но…но это невозможно. Это не моя….
Таможенник: Сэр, Вы должны запомнить, если Вы занимаетесь контрабандой, Вы теряете все. И к тому же платите штраф.

5. **Таможенник:** Ваш паспорт, пожалуйста. Как долго Вы планируете находиться в стране?
Гость: Три недели. Я могу продлить въездную визу в случае необходимости?
Таможенник: Конечно, Вы декларируете что-либо?
Гость: Простите?
Таможенник: Алкоголь, сигареты, свежие фрукты…?
Гость: О, нет.
Таможенник: Откройте чемодан, пожалуйста. Какие-нибудь подарки?
Гость: Только одна бутылка водки.
Таможенник: Хорошо, это не облагается пошлиной. Вот Ваша форма.

identify these parts. It is a simplified picture of the inside of a typical vertical four stroke cycle diesel engine. The important parts are labelled. You can use the Vocabulary and a dictionary while reading the text. Memorize the names of the parts.

Text 1

BASIC CONSTRUCTION OF A DIESEL ENGINE

The power of a diesel engine originates in the cylinder. Oil fuel is sprayed into the cylinder by the fuel-injection pump. There it meets the air which was compressed by the piston while the piston was being pushed upward in the cylinder. The oil burns producing heat and more pressure. The hot confined gases press the piston downward with greater force than was used to push it upward. The piston pushes on the connecting rod which connects the piston to the crank on the crankshaft. The force on the crank makes the crankshaft turn in its bearings, and the rotating crankshaft supplies power to the machinery the engine drives. This is the way in which the diesel engine changes the heat energy of oil into mechanical power. These operations are performed by the following essential parts: 1. **A piston** sliding in a cylinder. The piston has two jobs: first, to compress the air change, second, to receive the pressure of the gases while they are burning and expanding. Each piston is fitted with piston rings. Generally rings above the piston pin seal the combustion chamber, and those below the piston pin, the oil rings, control the amount of oil on the cylinder walls. Piston rings also assist in the transfer of heat from the piston to the cylinder walls. 2 .**A cylinder head** which closes the top end of the cylinder so as to make a confined space in which to compress the air and to confine the gases while they are burning and expanding. 3.**Valves** or **ports** to admit the air and to discharge the spent or exhaust gases. 4. **A connecting rod** to transmit force in either directions from the piston to the crank on the crankshaft. 5. **A crankshaft** and the **main bearings** which support the crank-

shaft and permit it to rotate. 6. **A supporting structure** to hold the cylinders, crankshaft and main bearings in firm relation to each other. This structure is usually made up of two parts, called **frame** and **bedplate**. 7. **A fuel-injection pump** to force the oil into the cylinder, also fuel-injection nozzle to break up the oil into a fine spray as it enters the cylinder. 8. **A camshaft**, driven by the crankshaft, to operate the fuel-injection pump and also to open valves. 9. **A flywheel** to store up surplus energy on the power (firing) stroke and to return that energy when the piston is being pushed upward on the compression stroke. 10. **A governor** or **a throttle** to regulate the amount of fuel supplied at each stroke, and thus to control the engine speed and power. 11. **Miscellaneous parts**, such as piping to supply air and remove exhaust gases, lubricating system to lubricate the moving parts, water jacket to cool the cylinder. 12. **A blower**-in a two-stroke cycle engine. (Fig. 4).

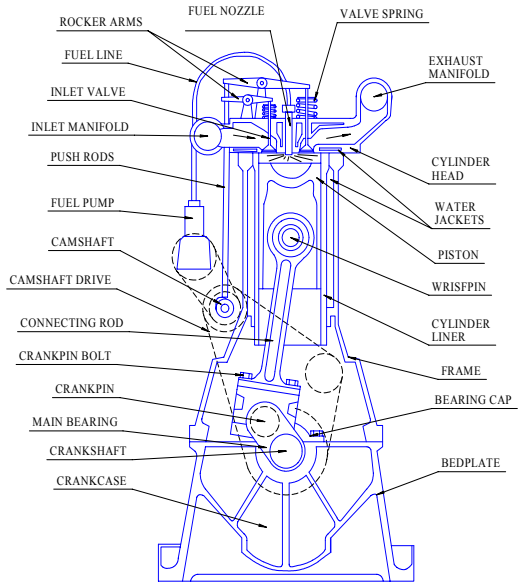


Fig. 4. Parts of a Four-Cycle Diesel Engine.

a) The visa must be stapled in the passport.
b) To visit the USA you should have an invitation.
c) Visitors have to pay an excess luggage charge.
d) You can bring more than two blocks of cigarettes to England.
e) They have limitations to currency in England.
f) If you visa expires, you'd make sure to extend it in advance.
g) When you smuggle things you pay a fine.
h) You must check in for the flight before getting on board the plane.
i) You always have something to declare.

Task 12
Try to memorize the above dialogues. Dramatize them.

Task 13
Say these dialogues in English:

1. **Таможенник:** Приготовьте Ваши паспорта, пожалуйста. Ваш паспорт, пожалуйста.
Гость: Да-а… Минуточку. Он у меня в сумке. Ага, вот он.
Таможенник: Вы гражданин Великобритании?
Гость: Нет, я из России.
Таможенник: Извините… Все в порядке.
Гость: Спасибо.

2. **Таможенник:** Доброе утро. Вы желаете что-либо заявить?
Гость: Нет. У меня в чемодане только личные вещи. Открыть?
Таможенник: Нет спасибо. Все в порядке.

a) You must weight it too.
b) Passport control is that way.
c) Yes, sir, that will be all.
d) Here it is.
e) Yes, it must be here somewhere….
f) I am planning to stay here for 2 weeks.
g) No, thank you, sir. You needn't.
h) No, it isn't Mine is the brown one.
i) Only personal things
j) You see, security has been tightened recently.
k) I don't think so.
l) I have been invited to take part in a conference in California.

Task 10

a) **Advise your friend to:** get acquainted with the customs regulations in the USA before going there on a business trip, find out the validity of his visa, take only hand luggage, bring some gifts for his friends in America, have a laptop computer on his business trip to England.

b) **Advise your friend not to:** bring in more than two bottles of alcohol to England, have excess luggage, smuggle things, avoid bringing in fresh fruit and plant to England, violate the customs regulations of the country he is going to visit.

Task 11

Agree or disagree with these statements using the following phrases:

agreement	**disagreement**
I (quite) agree with you	**I can't (don't) agree with**

Task 2

Find the English equivalents of the words and word combinations used in the text. Memorize them: поршень, теплота, сила, расширять (ся), головка цилиндра, верх, ограничивать, клапан, отработавшие газы, шатун, передавать, коленчатый вал, подшипник, коренной подшипник (подшипник коленчатого вала), вращаться, рама, опорная (фундаментная) плита, кулачковый (распределительный) вал, маховик, регулятор, дроссель, скорость, система смазки, водяная рубашка, охлаждать.

Task 3

Find in the text the sentences with:

a) the Passive Voice and translate them into Russian in writing;

b) the Infinitives, state their functions and translate the sentences into Russian in writing.

Task 4

Describe the construction of a diesel engine in English.

Task 5

Read Text 2 to answer the questions below it. Before reading the text find the meaning of the following words and word combinations: piston pin, reciprocating motion, rotary motion, drive wheel, belt pulley, PTO (power take off), bearing, gear, fan, non-adjustable, one solid piece, to drive (driving).

Text 2

Power from the piston is transmitted through the piston pin and connecting rod to the crankshaft which transforms the reciprocating motion of the piston into rotary motion. Rotary motion is

needed at the drive wheels, belt pulley and PTO (power take off).

The crankshaft is the largest and heaviest shaft in the engine. It is carried in large bearings. The flywheel is bolted to the rear of the crankshaft. The front of the crankshaft carries the small crankshaft gear and also a pulley used for driving the fan of the cooling system. The crankshaft gear drives the gear at the front of the camshaft. The camshaft of a four-cylinder engine is supported by three non-adjustable bearings carried in the engine block. At is located above and at one side of the crankshaft. At is made from one solid piece of steel. The raised pieces on the shaft are called cams. The camshaft for a four-cylinder engine has light cams, one for each valve.

1. What is the function of the crankshaft?
2. What motion is needed at the drive wheels?
3. Where is the flywheel situated?
4. How is the fan of the cooling system driven?
5. Where is the camshaft situated?
6. What is a cam?
7. What is the function of the camshaft?
8. Which of the two shafts is larger and heavier?

Task 6
Title the text.

Task 7
Give a summary of the text in Russian.

LESSON 5

Task 1

Now you will read Text 1 "How a Diesel Engine works". Before reading the text try to predict what information you will find in it choosing the statements from the given below:

i) We have no ***restrictions*** as to currency.
j) Your passport and visa are ***in order***.
k) We ***are glad*** to see you in the United States!

Task 7
Give short English answers to these questions:
a) Это Ваш чемодан, сэр?
b) Вы гражданин России?
c) Вы желаете что-либо заявить?
d) Мне открыть сумку?
e) Вы внесли эту видеокамеру в Вашу декларацию?
f) Не могли бы Вы открыть сумку, сэр?
g) Вы намерены пробыть в США 2 недели?
h) Приглашение у Вас с собой?
i) Вы можете положить Ваши сумки на стол?
j) Регистрация рейса на Москву здесь?
k) Эту маленькую сумку я тоже должен взвесить?
l) Чемодан не откроете?

Task 8
Ask your friend:
a) if he is going to visit the USA.
b) what he will take with him on his visit to the USA.
c) how he wants to get to the USA.
d) whom he intends to visit in the USA.
e) if he knew that it was forbidden to bring in more than two bottles of alcohol and two blocks of cigarettes to England.
f) when he visited the USA last time.
g) why he takes his laptop computer with him.

Task 9
Look at the answers. What are the questions?

that much. Here are your ticket and your boarding pass.

Visitor: Thank you. Which way do I go now?

Officer: Passport control is that way.

Visitor: Thank you.

Task 3

Read the dialogues in pairs, switch the roles.

Task 4

Give English equivalents of the following phrases:

Таможенные правила, не подлежащий оплате таможенными пошлинами, въездная виза, необходимые сведения, пройти таможенный досмотр, контрабанда, срок действия визы, приглашение, таможенная декларация, выездная виза, штраф, билет, чемодан, деловая поездка, таможенные ограничения.

Task 5

Find in the dialogues words and phrases from the Vocabulary of the Unit.

Task 6

Replace the words and phrases in italics by those from the dialogues:

a) There are only personal ***belongings*** in my suitcase.

b) Is it you hand ***baggage***, sir?

c) How long are you ***planning*** to stay here?

d) ***Could you kindly open*** this bag, sir?

e) I have five ***blocks*** of cigarettes.

f) When you smuggle things you lose them, and you pay ***some money*** as well.

g) The customs ***official*** will help you.

h) Yes, you ***may have*** that much.

1. The advantages of a diesel engine.
2. The main parts of a diesel engine.
3. The intake (admission) stroke in a diesel engine.
4. The cooling system of a diesel engine.
5. The compression stroke in a diesel engine.
6. From the history of diesel engines.
7. The power (combustion, expansion) stroke in a diesel engine.
8. The disadvantages of a diesel engine.
9. The exhaust (ejection) stroke in a diesel engine.
10. The four-stroke cycle gasoline engines.

Task 2

Read the text to see if you are right.

Text 1

HOW A DIESEL ENGINE WORKS

Internal combustion engines, both diesel and gasoline, must have mechanisms for (1) getting the charge of air and fuel into the cylinder, (2) igniting the fuel, (3) permitting the hot gases to expand and move the piston, and finally (4) expelling the spent gases to prepare for the next charge. This sequence of events in the engine cylinder is called a cycle. Each directional movement in the cylinder is called a stroke. There are two basic types of internal combustion engines: four-stroke cycle and two-stroke cycle.

In the four-stroke cycle gasoline engine four events (or strokes) occur. They are the intake (admission), compression, power (expansion, firing) and exhaust (ejection) strokes (Fig. 5.1).

On the **intake stroke** the air-fuel mixture from the carburetor enters the combustion chamber through the intake valve as the piston moves down. The exhaust valve is closed (Fig. 5.1 a).

On the next stroke – or **compression stroke** – the piston moves up increasing the pressure on the fuel-air mixture. Both in-

take and exhaust valves are closed now (Fig. 5.1 b).

As the piston completes its upward compression stroke, the compressed fuel-air mixture is ignited by the spark plug. The force of the combustion causes the piston to move downward with great force. Both intake and exhaust valves remain closed (Fig. 5.1 c).

On the **exhaust stroke** the piston begins to move upward as the exhaust valve opens. Spent gases are forced out of the combustion chamber through the exhaust valve opening (Fig. 5.1 d).

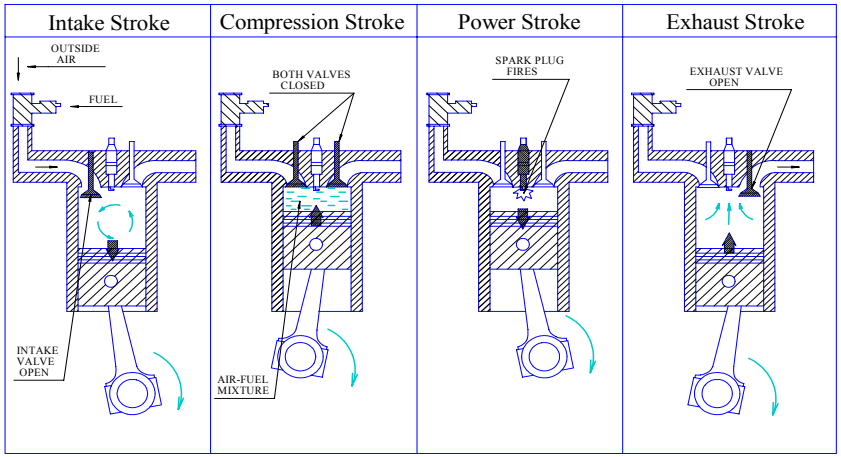


Fig 5.1. A four-stroke gasoline engine takes two revolutions of the crankshaft to compete a cycle.

The four-stroke cycle diesel engine, like the gasoline engine, has four basic strokes in a single cycle, however, there are differences (Fig. 5.2).

Intake stroke. The intake stroke in the diesel engine differs from that of the gasoline engine in only air is drawn into the cylinder – not an air-fuel mixture as in the gasoline engine. As the piston moves downward, the intake valve opens, allowing air to

the Cal Tech in Pasadena, California.

Officer: Do you happen to have an invitation.

Gabitov: Oh, yes…yes, it must be here somewhere… There you go.

Officer: Right. How long are you going to stay here?

Gabitov: Two weeks. Is that all?

Officer: Yes, sir. Here is your passport. Welcome to the United States, Mr. Gabitov!

6. **Officer:** Is this you luggage, sir?
Visitor: Yes, just these two bags.
Officer: Do you have anything to declare-liquors, cigarettes?
Visitor: I don't think so. No oranges or apples, either.
Officer: Would you mind opening this bag, sir?
Visitor: Not at all. Is there anything wrong?
Officer: What's this gray plastic thing?
Visitor: Oh, It's my laptop computer. Do you want me to open it?
Officer: Please open it and turn it on… Thanks.
Visitor: You don't leave much to chance, do you?
Officer: Well, you see security has been tightened recently.
Visitor: Is everything OK now?
Officer: Yes, sir. That will be all.

7. (On the Way Back)
Visitor: Do I check in for the flight to Moscow here?
Officer: Yes, that's right. May I see your ticket and passport, please? And your bag. Put it on the scales, please.
Visitor: Here it is. And must I weigh this small bag, too?
Officer: Is it you hand luggage, sir?
Visitor: Yes, it is.
Officer: You must weigh it too. … Yes, you are allowed

when I packed the bag this morning.

Officer: Very well, sir. And what about this box of cigars?

Visitor: That wasn't there, either. Really! I did not buy any cigars. At all!

Officer: Well, sir, you must remember, when you smuggle things you lose them. And you pay a fine as well.

4. **Officer:** Can you put your bags on the table? … Well, 23 kilos. I'm sorry, but you'll have to pay an excess luggage charge.

Visitor: Oh! It's only three kilos overweight.

Officer: Yes, sir… that's $6…. Thank you. Have you anything to declare?

Visitor: Pardon?

Officer: Alcohol, cigarettes, fresh, fruit, plants…?

Visitor: Uh, no.

Officer: Open your suitcase, please. Any gifts?

Visitor: Only one bottle of vodka.

Officer: All right. It's duty free. As you probably know, it's forbidden to bring in more than two bottles of alcohol and two blocks of cigarettes to England. And no limitations as to currency. Here is your form.

Visitor: Thank you.

Officer: Not at all. Next, please!

5. **Officer:** Next, please!

Visitor: Hello!

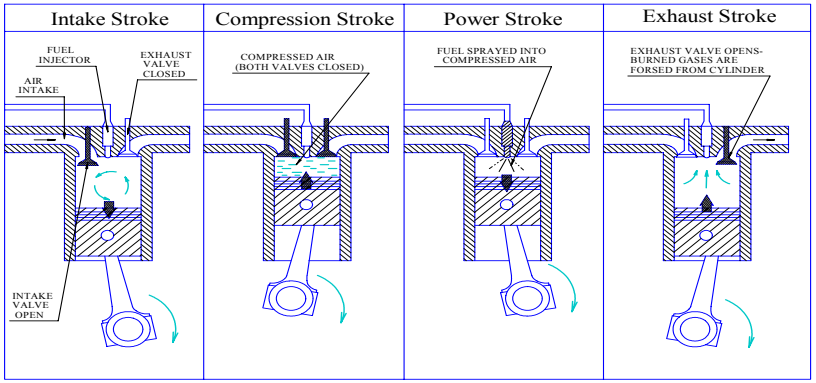
Officer: Good morning, sir. May I see your passport, please?

Visitor: Sure, here you are. The visa is stapled in it.

Officer: Where are you going to stay in America, Mr. … uh … Gabitov?

Gabitov: I've been invited to take part in a conference at

enter the cylinder. The exhaust valve is closed (Fig. 5.2 a).



a) **b)** **c)** **d)**

Fig. 5.2. The four strokes of a diesel engine are similar to the four strokes of a spark-ignition engine.

Compression stroke. The major difference between the compression stroke in the two engines (diesel versus gasoline) is the compression ratio in the cylinder. The compression ratio is described as the relationship between (1) the total volume inside the cylinder when the piston is at its greatest distance from the cylinder head and (2) the volume when the piston is closest to the cylinder head. This compression ratio is much greater in the diesel engine than in the gasoline engine: 16:1 (up to 25:1) versus 8:1.

Another difference in the compression stroke of the diesel engine is that fuel is injected directly into the cylinder by a fuel injector and is then mixed with air already in the cylinder. The heat of compression ignites the injected fuel. Both intake and exhaust valves are closed (Fig. 5.2 b).

Power stroke. The temperature rises in the cylinder as the heat of compression ignites the fuel, it starts burning, the tremen-

dous pressure forces the piston downward and expansion begins. Both intake and exhaust valves remain closed (Fig. 5.2 c).

Exhaust stroke. The exhaust valve opens shortly before the piston reaches bottom dead center. As the piston begins to move upward, it pushes the spent gases out of the exhaust valve port, clearing the cylinder for the next charge (Fig 5.2 d).

Task 3

Read the text again using the Vocabulary and a dictionary to answer the following questions. Figures 5.1 and 5.2 will help you:

1. What is a cycle?
2. What is a stroke?
3. What are the two basic types of engines?
4. What are the four basic strokes in a singe cycle?
5. How does the intake stroke in the diesel engine differ from that of the gasoline engine?
6. How is the compression ratio described?
7. What is the compression ratio in a diesel engine?
8. What are the differences between the strokes in gasoline and diesel engines?

Task 4

Fill in the chart with the following special terms. Mind the sequence of events in the working cycle of a four-stroke cycle diesel engine. Memorize the terms:

exhaust stroke, expansion, compression, power stroke, intake, mixing, exhaust, compression stroke, ignition, intake stroke, burning.

Study the Vocabulary of the Unit.

Task 2

Translate these dialogues. Practice them in pairs.

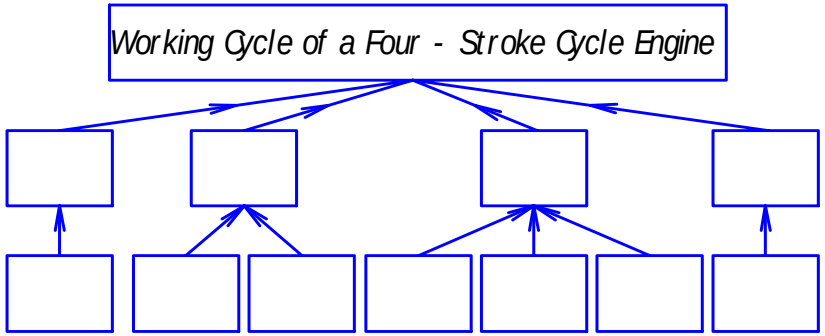
1. **Officer:** Good afternoon, sir. Is this your suitcase?
Visitor: No, it isn't. Mine is the brown one.
Officer: Oh, I see. Have you anything to declare?
Visitor: No, I haven't. There are only personal belongings in my suitcase. Shall I open it?
Officer: No, thank you, sir. You needn't. It's all right. You may go through passport control now. Straight on, please.
Visitor: Thank you, Officer. Good afternoon.

2. **Officer:** Will you show your things, please?
Visitor: Yes, here they are. I have two pieces: this suitcase and some hand luggage.
Officer: Do you have anything to declare?
Visitor: No, I don't. I have five packs of cigarettes, though.
Officer: This quantity is not liable to duty. And what do you have in your suitcase?
Visitor: Only personal things.
Officer: Thank you that's all.
Visitor: Thank you.

3. **Officer:** Have you anything to declare, sir?
Visitor: Anything to declare? No! Uh… nothing.
Officer: I see, sir. Will you please open your suitcase?
Visitor: Well, you see…. But…
Officer: Uh… Hmm. What's this under this jacket, here?
Visitor: What?
Officer: Five bottles of brandy?
Visitor: But… but that's impossible. They were not there

customs regulations	таможенные правила
customs restrictions	таможенные ограничения
customs declaration form	таможенная декларация
to declare smth	сделать заявление о наличии вещей, облагаемых пошлиной
liable to duty	подлежащий оплате таможенными пошлинами
duty free	не подлежащий оплате пошлинами
duty free quota list	список предметов, разрешенных к безналичному ввозу
prohibited articles list	список предметов, ввоз или вывоз которых запрещен
particulars	необходимые сведения, подробности
personal things (belongings)	личные вещи
to go (pass) through the customs	пройти таможенный досмотр
to be cleared by the customs	
smuggling	контрабанда
customs clearing	таможенный досмотр
validity of a visa	срок действия воза
landing formalities	формальности, выполняемые пассажиром после приземления
to take finger prints	снимать отпечаток пальцев (для США)
the customs officer (official)	таможенник
customs duties	таможенные пошлины
to fill in a customs declaration	заполнить таможенную декларацию

Task 1



Task 5

Translate:

a) the terms in the chart into Russian;

b) the following words and word combinations into English. Memorize them: заряд, расширяться, удалять (выбрасывать, выталкивать), последовательность, направленное движение, горючее, смесь, впускной клапан, выпускной клапан, степень сжатия, объем, зажигать, нижняя мертвая точка, верхняя мертвая точка.

Task 6

Find in the text:

a) the sentences with the Passive Voice and translate them into Russian in writing;

b) the sentence with “that” in the function of a word-substitute and translate it into Russian in writing.

Task 7

Look through Text 2 and try to understand what it is about.

Text 2

Engines are also being built to operate on a cycle which is completed in two piston strokes. A blower is often used on diesel engine to force air into the cylinder.

Stroke 1. The air blower forces air (intake stroke) into the combustion chamber through small holes, called ports, that are located in the cylinder walls. This action also helps clear the exhaust gases from the combustion chamber. The exhaust valve closes while the upward stroke of the piston seals off the intake ports. As the piston continues to move upward, the air in the combustion chamber becomes highly compressed (combustion stroke).

Stroke 2. As the piston reaches the top of its stroke, fuel is injected into the combustion chamber and ignited by the heat generated by the compressed air. The piston now moves downward (power stroke). As the piston moves past the ports in the cylinder, air entering the cylinder forces the burned gases out of the exhaust valve, which is now open (exhaust stroke).

Task 8

Read the text and state the function of the blower in this type of engines.

Task 9

Title the text.

Task 10

Render the text in Russian.

Task 11

Speak about the two types of engines using the information of texts 1 and 2. Thoroughly think over your questions and answers.

UNIT3

GOING THROUGH BORDER AND CUSTOMS FORMALITIES (FOR A BUSINESS TRIP)

People start on their journey for different reasons. Nowadays the scientific and technological progress has made it possible to overcome time and distance, to cover in the twinkling of an eye the vast expanse of our planet. The whole world is open now.

People have at their disposal various means of transport. All of them have their advantages and disadvantages, and people choose one according to their plans and destination.

If you want to go to another country to learn, to apply for a job, to take part in a conference or on some other business the best way is to do it by plane (air). You can also go by train (rail) or by car. Coach tours are not expensive and preferred by students who go to Great Britain for seasonal farm work.

In any case you must pass through border and customs formalities at the border if you go by train, car or coach, and at the airport if you go by plane. Those who want to visit any country must know the customs regulations indicating what is allowed to be brought in and taken out of the country, and what is not and fill in a customs declaration.

Below you can find some words and phrases which will help you to be cleared by the customs.

ACTIVE VOCABULARY

passport	паспорт
visa (transit, entry, exit)	виза (транзитная, въездная, выездная)
to extend (entrance) the visa	продлить визу
to come by invitation	приехать по приглашению

h) if the computer is of great help to you in your studies and research work.

Task 2

Say if you have ever worked on an electronically controlled tractor or farm machine. If you have, tell what your impressions are.

Task 3

Comment on the statement: "Computer is one of the greatest inventions of the 20th century, but there are some problems with it". You can use the information you've got from the texts of this Unit.

Task 12

Read Text 3 to get some information on modern electronically controlled diesel engine. You can use the Vocabulary and a dictionary. Title the text.

Text 3

A vital component of older diesel engine systems was the **governor**, which limited the speed of the engine by controlling the rate of fuel delivery. Unlike a petrol (gasoline) engine the incoming air is not **throttled**, so the engine would **overspeed** is this was not done. Older injection systems were driven by a gear system from the engine (and thus supplied fuel only linearly with engine speed). Modern electronically controlled engines apply similar control to petrol engines and limit the maximum RPM through **electronic control module** (ECM) or electronic control unit (ECU) – the engine-mounted "computer". The ECM/ECU receives an engine speed signal from a sensor and then using its algorithms and look – up calibration tables stored in the ECM/ECU, it controls the amount of fuel and its timing (the "start of injection") through electric or hydraulic actuators to maintain engine speed.

Controlling the timing of the **start of injection** of fuel into the cylinder is key to minimizing the emissions, and maximizing the fuel economy (efficiency) of the engine. The exact timing of starting the fuel injection into the cylinder is controlled electronically in most of today's modern engines. The timing is usually measured in units of crank angle of the piston before **Top Dead Center** (TDC) For example, if the ECM/ECU initiates fuel injection when the piston is 10 degrees before TDC, the start of injection or "timing" is said to be 10 deg BTDC. The optimal timing will depend on both the engine design as well as its speed and load.

LESSON 6

Task 1

Read the title of Text 1 and say what it is about.

Text 1

THE DIESEL AIR SYSTEM

The diesel air induction system is one of the four major systems necessary for a diesel engine to develop power and maintain a long useful life. The others are the fuel system, the cooling system and the lubrication system.

The speed and power are known to be controlled by changing the amount of fuel sprayed into the compressed air in the cylinder. Both the amount of air and the amount of fuel are important. A lack of sufficient air will reduce power and engine life while increasing smoke and exhaust temperature. Increasing the amount of fuel injected into the engine will not increase speed and power if there is not enough air to mix with fuel.

In four-stroke cycle engines the efficiency with which the engine can draw air into the cylinder is called volumetric efficiency.

A high percentage of diesel engines are turbocharged. The turbocharger is a centrifugal blower that is driven by exhaust gases. One reason for placing a turbocharger on an engine is to force more air into the cylinder so more fuel can be burned, thus increasing power. Another reason is to compensate for reduced air pressure at higher altitudes. The net effect of the turbocharger is to increase the volumetric efficiency. The air system must supply oxygen to the cylinders for the fuel to burn, and it must exhaust the gases that remain after combustion. The air system consists of two basic areas: the intake side and the discharge side.

On the intake side the piping usually begins with a pre-cleaner followed by an air filter. The pre-cleaner removes the large dirt particles, and the air filter removes the finer dirt particles

and he was immediately hooked. Within a week he had surpassed the knowledge of the computer teacher at Lakeside. Learning the BASIC programming language was a breeze for Bill and he was soon writing his own programs.

During this time Bill met Paul Allen his business partner for the rest of his life. Together they started a small company called Traf-O-Data, they sold a small computer outfitted with their program that could count traffic for the city. This company wasn't a big success but it did earn the two boys some money as well as good business skills. Bill also wrote a schedule program for his school which he modified a bit to put little Bill Gates in a class full of the prettiest girls in the school. Bill was deemed by his peers and his teachers as the smartest kid on campus. Upon graduating from Lakeside Bill enrolled in Harvard University in 1973, one of the best universities in the country. The intense lifestyle Bill lived during his first year in Harvard made him ill for most of the summer of 1974. Bill soon left Harvard for business opportunities in programming which turned him into a multi-billionaire.

A very interesting man, Bill Gates is now known as the founder of Microsoft.

SPEECH PRACTICE

Task 1

Say

a) whether you use a computer at home, at the University or somewhere else;

b) what programs you use;

c) what information you are interested in;

d) if you can always get the necessary information;

e) if it is too expensive for you to be “on the Internet”;

f) if you use a computer only for playing computer games;

g) if you have any computer game partners in other

Fill in the blanks with the words from the text:

1. The WWW is a … of text and multimedia documents and ... other Network services.
2. The Web represents the application the hypertext technology and a graphical ... to the Internet.
3. The net is called the ... because it is made up of many....
4. Web sites, also called Web... are really Internet....
5. The starting point for any Web site is called its home....
6. Each page is an Internet site and must be accessed via a special program called a Web....
7. A ... control interface allows the user to navigate through the Web.

Task 21

Find in the text the key words you can use to speak about the WWW.

Task 22

Write a summary of the text in English.

Task 23

Read Text 6 and comment on its contents.

Text 6

BILL GATES

William Henry Gates III was born in Seattle, Washington on October 28th, 1955. As a child Bill enjoyed rocking back and forth, today he still has a habit of rocking when he is thinking about something. Bill was very bored at school and his parents knew it, so they were always trying to feed him more information to keep him busy. Bills parents finally decided to put him in a private school where he would be challenged more. The Lakeside private school had just bought a new computer when Bill arrived,

and dust. The cleaned air is ducted to one of the following: an intake manifold on four-stroke cycle engines, the blower on two-stroke cycle engines, or the turbocharger inlet on turbocharged engines.

On the discharge side, there should be some arrangement for muffling the noise of the engine. A muffler serves to decrease the velocity of the gases and absorb waves from the explosions in the cylinder.

Task 2

Read the text and try to understand its general contents. Figure 6 will help you.

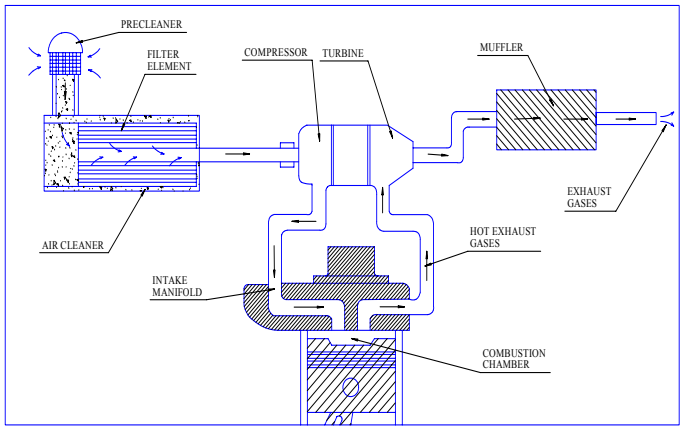


Fig. 6. The basic parts of the diesel air system.

Task 3

Read the text using the Vocabulary and a dictionary and say what paragraphs deal with:

a) the importance of the amount of air and the amount

of fuel injected into the engine;

b) the reasons for placing a turbocharger on an engine;

c) the description of two basic areas of the air system.

Task 4

Answer these questions:

1. What are the four major systems necessary for a diesel engine?
2. What is volumetric efficiency?
3. What is a turbocharger?
4. What are the two reasons for placing a turbocharger on an engine?
5. How many basic areas does the air system consist of?
6. What is the function of the pre-cleaner?
7. What is the function of the air filter?
8. What does a muffler serve for?

Task 5

Find in Text 1 the sentences with Infinitive constructions (Complex Subject, For-phrase) and translate them into Russian in writing.

Task 6

Find in the text and write out the special terms which can be used to write an annotation (summary) of the text in English. Memorize them.

Task 7

Write an annotation (summary) of the text in English. While writing it make use of the following plan and phrases:

- **the field of knowledge:** the text is addressed to …
- **the topic of the text:** the text deals with…, the text is about, the text is concerned with…, the text highlights the prob-

across many computers around the world. The net is called the Web because it is made up of many sites, all linked together, with users travelling from one site to the next by clicking a computer's pointing device on a hyperlink.

Web sites, also called Web pages, are really Internet sites that all use the same techniques. Each Web page can contain many screens or printed pages of text, graphics, audio, and even video, and the starting point for any Web site is called its home page. Although each page is an Internet site, it must be accessed via a special program called a Web browser.

Interactive television is a generic term that encompasses a variety of Web-related television technologies and products. Typically, a home television receiver and a telephone line are connected through a small appliance that accesses the Internet through the telephone line and converts the downloaded Web pages into a form that can be displayed on the receiver. A remote control interface allows the user to navigate through the Web and select the information to be displayed.

All kinds of things are available on the WWW. You can use it for education recreation and shopping. You can visit other countries and cities, you can learn foreign languages and meet new friends, and, of course, you can play computer games through the WWW, competing with you partners from other countries and continents. Everything that can be put into digital format and stored in a computer can be available on the WWW.

Task 19

Find in the text the paragraph describing the basic recreational applications of the WWW and translate it into Russian in writing.

Task 20

Find in Text 4 the paragraph describing the Internet problems and translate it into Russian in writing.

Task 16

Answer these questions:

1. When and where did the Internet begin?
2. What was the Internet designed to?
3. Why is the Internet especially popular among scientists?
4. Why do people want to be "on the Internet"?
5. What does one "do" with the Internet?
6. What is the most popular Internet service?
7. What other popular services are available on the Internet?
8. What are discussion groups?
9. Are there any problems connected with the Internet? What are they?

Task 17

Write a summary of the text in English.

Task 18

Read Text 5 using a dictionary.

Text 5

THE WORLD WIDE WEB

The World Wide Web (WWW) is a collection of globally distributed text and multimedia documents and files and other network services linked in such a way as to create an immense electronic library from which information can be retrieved quickly by intuitive searchers. The Web represents the application of hypertext technology and a graphical interface to the Internet to retrieve information that is contained in specially formatted documents that may reside in the same computer or be distributed

lem(s) of…, the text describes….

- **publisher's imprint:** the text is published…, the text is included ….
- **the basic ideas of the text:** the author describes, the author considers, the author suggests that…., the author pays particular attention to…, the author goes on to say that…, in conclusion the author says that….

Task 8

a) Read the title of Text 2. Give your idea of its contents.

b) Read the text to find out if you are right.

Text 2

DRY-TYPE AIR CLEANER

In recent years many diesel engines have been equipped with dry-type air cleaners. Dry-type air cleaner is attached to the intake manifold. One advantage of this filter is that it can be mounted in any position. Other advantages include the following: ease of service, longer intervals between times of servicing, ease of air passage, more efficiency at a wider range of speeds, less damage to the engine of it is not properly served.

One type of dry air cleaner uses a replaceable paper element or cartridge, as a filter. Another type of dry air cleaner uses tubes with spiral rotors.

Many dry air cleaners have two elements. The primary (outer) element is a large, high-capacity element that can be cleaned or washed between filter elements changes. The secondary inner filters provides extra protection if there is damage to the primary filter. The secondary filter cannot be cleaned or washed, it must not be removed except to be replaced.

Task 9

Read the text once again and say what paragraphs deal with:

a) the advantages of a dry-type air cleaner;
b) the two elements used in dry cleaners.

Task 10

Tell about dry-type air cleaners in Russian.

LESSON 7

Task 1

Read Text 1 and say what the basic parts of a common diesel fuel system are, and what functions they perform.

Text 1

THE DIESEL FUEL SYSTEM

The purpose of the diesel fuel system is to transmit fuel from the fuel tank to the engine, where it is injected into the cylinder combustion chamber to be burned. The basic parts of a common diesel fuel system are the lines, tank, transfer pump, filters, injection pump and injection nozzles (Figure 7.1).

The fuel system performs the following specific functions: supplies clean fuel to the engine, meters the correct amount of fuel, times the injection, so fuel is burned at the optimum point in the cycle, injects, atomizes and distributes fuel into the combustion chamber, controls the engine speed. The fuel lines on a diesel engine carry fuel at varying levels of pressure. The fuel lines must be handled carefully to avoid damage that could restrict the fuel flow.

The fuel tank size is determined by the engine designers to allow the tank to hold enough fuel so that the engine can operate for a reasonable amount of time without the need for refueling. The shape is usually determined by the configuration of the ma-

search enormously. The Internet has moved into research institutions, elementary and high school, as well as into public libraries and the commercial sector.

Why do people want to be “on the Internet”? One of the main reasons is simple freedom. There is no “Internet Inc.” There are no official censors, no bosses, no board of directors, no stockholders. Still, its various interest groups all have a claim. Business people want the Internet put on a sound financial footing. Government people want the Internet more fully regulated. Academicians want it dedicated exclusively to scholarly research. Military people want it spy-proof and secure. And so on and so on.

But what does one “do” with the Internet? Four things, basically: mail, discussion groups, long-distance computing and file transfers.

“The most popular Internet service is e-mail”, electronic mail, and it is global in scope. Other popular services are available on the Internet: reading USENET News, using the World Wide Web, Telnet, FTP and Gopher.

The discussion groups, or “newsgroups”, are a world of their own. This world of news, debate and argument is generally known as “USENET”. It is, in fact, quite different from Internet. USENET is rather like an enormous billowing crowd of gossipy, news-hungry people, wandering in and through the Internet on their way to various private backyard barbecues. The variety of subjects discussed is enormous, and it is growing larger all the time. Usenet also distributes various free electronic journals and publications, which are very often concerned with drugs, sex, violence, terrorism. It is very dangerous. There are some other problems, too. The most important one is security. Many good encoding programs are available to solve this problem.

Task 15

Write a summary of Text 3 in English.

Task 14

Read Text 4 using a dictionary. Write out the new terms on the subject "Computers". Memorize them.

Text 4

THE INTERNET

The Internet, a global computer network which embraces millions of users all over the world, began in the United States in 1969 as a military experiment. Postwar America would need a command-and-control network linked from city to city, state to state, base to base. But no matter how thoroughly that network was armored or protected, its switches and wiring would always be vulnatable to the inpact of atomic bombs. The center of the network would be the very first place to go. The solution was daring, and the proposal was made public in 1964. The principles were simple. All the nodes in the network would be equal in status to all other nodes. The massages themselves “would be divided” into packets, each packet separately addressed. Each packet would begin at some specified source node and at some other specified destination node. Each packet would wind its way through the network on an individual basis.

By December 1969, there were four nodes on the infant network, which was named ARPANET, after its Pentagon sponsor. Today there are hundreds of thousands of nodes in the Internet, with more coming on line every day. Many million people use this gigantic mother-of-all-computer-networks. Most of the Internet host computers (more than 50%) are in the United States, while the rest are located in more than 100 other countries.

The Internet is especially popular among scientists. The powerful, sophisticated access that it provides to specialized data and personal communication has sped up the pace of scientific re-

chine and the space available. Diesel fuel tanks can be almost any shape.

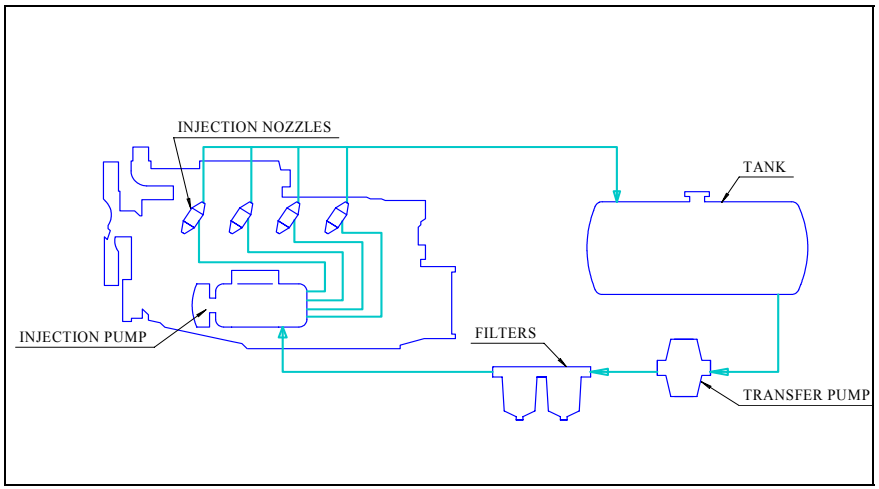


Fig. 7.1. Basic parts of a diesel fuel system.

On modern diesel engines the fuel is usually pumped through the fuel system by an engine-operated transfer pump that generally contains a screen filter.

Diesel fuels should be well filtered, because they tend to contain impurities, and some parts of the injection pumps are so precisely made that microscopic particles will damage them. A typical filter system has three stages of filters (Figure 7.2).

The first filter (screen) is designed to remove large particles. The next filter (primary filter) removes most of the small particles. The secondary (final) filter removes tiny particles. The primary and secondary elements may be combined in one housing, or they may be in individual housings.

The injection pumps for diesel engines have to meet extremely rigid specifications during manufacturing to perform precision timing functions in the field.

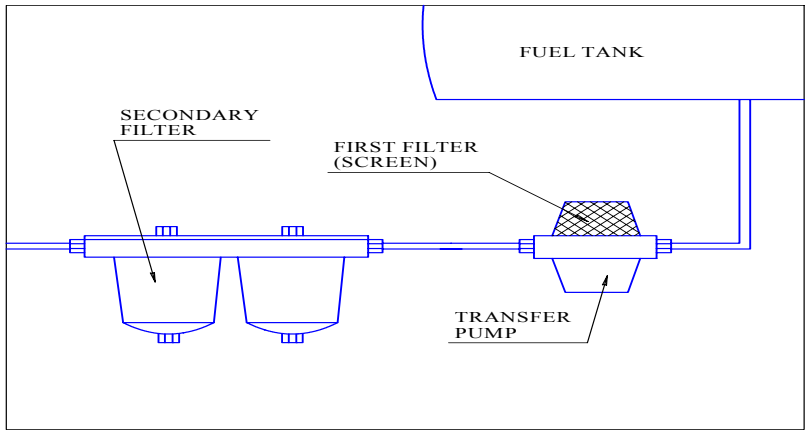


Fig. 7.2. A typical three-stage filter system.

It is known that for the diesel engine to provide maximum power and economy, the amount of fuel and the timing of the injection are important. Of equal importance is the fact that the fuel must be sprayed into the combustion chamber so that it is completely burned, with no smoky exhaust. Therefore it is the job of the injection nozzles to spray (or atomize) and distribute the fuel in the combustion chamber. Injector nozzles are of two types: open and closed.

Task 2

Read the text using the Vocabulary and a dictionary and fill in the chart with the Russian equivalents of the English terms in it. Pay special attention to the logical connection of the notions. Memorize the terms.

available in both "free software" and commercial versions, is increasing in popularity as an alternative to proprietary operating systems.

Windows 98 (called "Memphis" during development and previously called "Windows 97" based on an earlier schedule) is a widely-installed product in Microsoft's evolution of the Windows operating system for personal computers. Windows 98 expresses Microsoft's belief that users want and should have a global view of their potential resources and that Web technology should be an important part of the user interface. Although building Microsoft's own Web browser into the user desktop has been an issue in the U.S. Justice Department's suit, Windows 98 was released as planned with its tightly integrated browser.

The new series of operating system Microsoft are Windows Millenium, Windows 2000 and Windows XP. Each of these new products is addressed to both the corporate and private clients. New strategy of the Microsoft is aimed at creating “a one for all” product which will be useful for both the beginners and advanced users.

Task 10

Read the text using a dictionary. Pay special attention to the terms.

Task 11

Find in the text the paragraphs describing Unix operating systems and translate them into Russian in writing.

Task 12

Name all the operating systems mentioned in the text.

Task 13

OPERATING SYSTEMS

Operating systems control and manage the use of the hardware devices such as the printer or mouse. They also provide disk management by letting you store information in files. The operating system also allows you to run programs such as the basic word processor. Lastly, the operating system provides several of its own commands that help you use the computer.

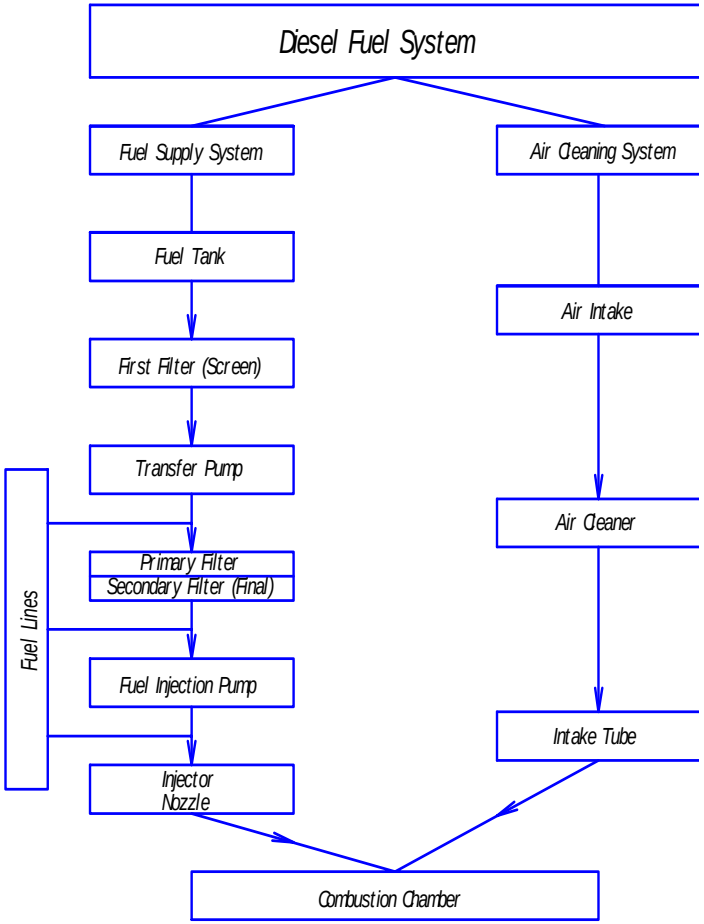
DOS (Disk Operating System) was the first widely-installed operating system for personal computers. (Earlier, the same name had been used for an IBM operating system for a line of business computers.)

The first personal computer version of DOS, called PC-DOS, was developed for IBM by Bill Gates and his new Microsoft Corporation. DOS was (and still is) a non-graphical line-oriented command- or menu-driven operating system, with a relatively simple interface.

The first Microsoft Windows operating system was really an application that ran on top of the MS-DOS operating system. Today, Windows operating systems continue to support DOS (or a DOS-like user interface) for special purposes by emulating the operating system.

Unix (often spelled "UNIX," especially as an official trademark) is an operating system that originated at Bell Labs in 1969 as an interactive time-sharing system. Ken Thompson and Dennis Ritchie are considered the inventors of Unix. In 1974, Unix became the first operating system written in the C language. Unix has evolved as a kind of large freeware product, with many extensions and new ideas provided in a variety of versions of Unix by different companies, universities, and individuals.

Unix operating systems are used in widely-sold work-station products. The Unix environment and the client/server program model were important elements in the development of the Internet and the reshaping of computing as centered in networks rather than in individual computers. Linux, a Unix derivative



Task 3

a) Find in the text the paragraphs describing the fuel tank and a typical filter system and translate them into Russian.

b) Find in the last paragraph of the text the sentence with a for-Phrase and translate it into Russian in writing.

c) Find in the text the sentence where the verb "to

have" is used as the equivalent of a modal verb and translate in writing.

Task 4

Look through the text again to answer these questions:

1. What is the purpose of the diesel fuel system?
2. What are the basic parts of a common diesel fuel system?
3. Why must the fuel lines be handled carefully?
4. What is the function of the transfer pump?
5. Why should diesel fuels be well filtered?
6. What is a typical filter system in a diesel engine?
7. What is the function of the fuel injection pump in a diesel engine?
8. How does the fuel enter the combustion chamber in a diesel engine?
9. What are the types of injector nozzles in a diesel engine?

Task 5

Write a summary of the text in English.

Task 6

Read Text 2 using the Vocabulary and a dictionary. Try to distinguish the main features of the diesel fuel injection systems described in the text (Fig. 7.3 will help you do it). Comment on the information in Russian.

Text 2

COMMON RAIL DIRECT FUEL INJECTION

Common rail direct fuel injection is a modern variant of direct injection system for Diesel engines. It features a high-pressure (1000+ bar) fuel rail feeding individual solenoid valves,

abandon the keyboard and monitor that are the PC's trademarks. Instead they are trying to devise PCs with interpretive powers that are more humanlike – PCs that can hear you and see you, can tell when you are in a bad mood and know to ask questions when they don't understand something.

It is impossible to predict the invention that, like Altair, crystallize new approaches in a way that captures people's imagination.

1. When did the idea of a personal computer (PC) appear for the first time?
2. Why did the researchers at Xerox PARC think the PC would be extravagant no longer?
3. What are the chips of silicon?
4. What did the researchers at Xerox PARC develop?
5. When and how did PCs capture the popular imagination?
6. How did Steve Wasniak, Steve Gobs and Bill Gates contribute to the development of PCs in 1975?
7. What can you tell about Ed.Roberts?
8. Why did the researchers at Xerox and elsewhere think that Altair was too primitive to bring PCs to the masses?
9. When did the PCs become powerful enough to fulfill the original vision of the researchers?
10. What is an ideal PC?

Task 8

Write a summary of Text 2 in Russian.

Task 9

Look through Text 3 and say what its main information blocks are.

Text 3

they developed or refined much of what constitutes PCs today, from "mouse" pointing devices to software "window".

Although the work at Xerox PARC was crucial, it was not the spark that took PCs out of the hands of experts and put them into the popular imagination. That happened inauspiciously in January 1975, when the magazine "Popular Electronics" put a new kit for hobbyists, called the Altair, on its cover. For the first time, anybody with $400 and a soldering iron could buy and assemble his own computer. The Altair inspired Steve Wosniak and Steve Gobs to build the first Apple computer, and a young college dropout named Bill Gates to write software for it. Meanwhile, the person who deserves the credit for inventing the Altair, an engineer named Ed Roberts, left the industry he had spawned to go to medical school. Now he is a doctor in a small town in central Georgia.

To this day, researchers at Xerox and elsewhere pooh-pooh the Altair as too primitive to have made use of the technology they felt was needed to bring PCs to the masses. In a sense, they are right. The Altair incorporated one of the first single-chip microprocessor – a semiconductor chip that contained all the basic circuits needed to do calculations – called the Intel 8080. Although the 8080 was advanced for its time, it was far too slow to support the mouse, windows, and elaborate software Xerox had developed. Indeed, it wasn't until 1984, when Apple Computer's Macintosh burst onto the scene, that PCs were powerful enough to fulfill the original vision of researchers. "The kind of computing that people are trying to do today is just what we made at PARC in the early 1970s," says Alan Kay, a former Xerox researcher who jumped to Apple in the early 1980s.

Researchers today are proceeding in the same spirit that motivated Kay and his Xerox PARC colleagues in the 1970s: to make information more accessible to ordinary people. But a look into today's research labs reveals very little that resembles what we think of now as PC. For one thing, researchers seem eager to

as opposed to low-pressure fuel pump feeding pump nozzles or high-pressure fuel line to mechanical valves controlled by cams on the camshaft. Third generation common rail diesels now feature piezoelectric injectors for even greater accuracy, with fuel pressures up to 1,700 bar.

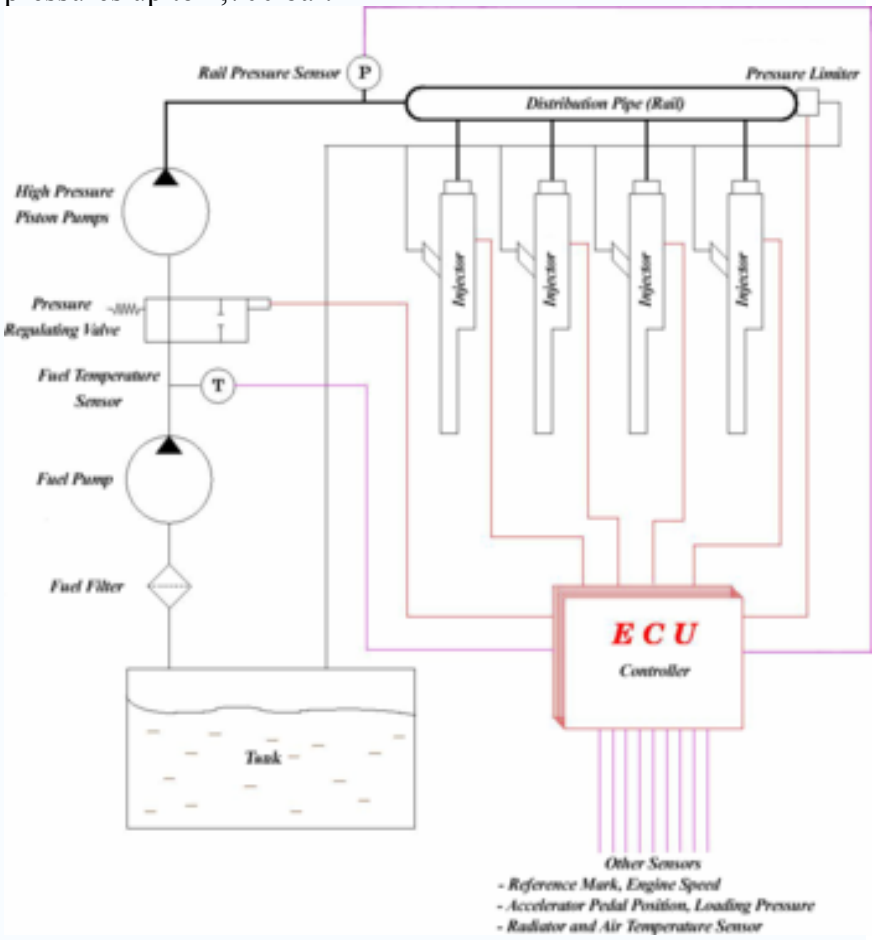


Fig. 7.3. Functional scheme of Common Rail fuel injection system.

The modern common rail system was extensively prototyped in the 1990's, with collaboration between Magneti Marelli, Centro Ricerche Fiat and Elasis. After research and development by the Fiat Group, the design was acquired by the German company Robert Bosch GmbH for completion of development and making suitable for mass-production. In 1997 they extended its use for passenger cars.

Solenoid or piezoelectric valves make possible fine electronic control over the injection time and amount, and the higher pressure that the common rail technology makes available provides better fuel atomization. In order to lower engine noise, a small "pilot" amount of fuel can be injected just before the main load, effectively reducing its explosiveness; some advanced common rail fuel systems perform as many as five injections per stroke. Common rail engines require no heating up time, and produce lower engine noise and lower emissions than older systems. In older diesel engines, a distributor-type injection pump, regulated by the engine, supplies bursts of fuel to injectors which are simply nozzles through which the diesel is sprayed into the engine's combustion chamber. As the fuel is at low pressure and there cannot be precise control of fuel delivery, the spray is relatively coarse and the combustion process is relatively crude and inefficient.

In common rail systems, the distributor injection pump is eliminated. Instead an extremely high pressure pump stores a reservoir of fuel at high pressure up to 1,800 bar (180 MPa) in a "common rail", basically a tube which in turn branches off to computer-controlled injector valves, each of which contains a precision-machined nozzle and a plunger driven by a solenoid. Driven by a computer (which also controls the amount of fuel to the pump), the valves, rather than pump timing, control the precise moment when the fuel injection into the cylinder occurs and also allow the pressure at which the fuel is injected into the cylinders to

Task 5

Answer these questions:

1. When were the first attempts to create a machine for performing basic mathematical functions made?
2. What country is Blaise Pascal from?
3. What did Charles Babbage do for a living?
4. When did Ch.Babbage design his machine?
5. What theory became fundamental to the design of computer circuitry?
6. Why are computers used more and more often in the world today?
7. Can one say that computers have any intelligence?
8. What does the term "software" introduce?

Task 6

Write an annotation of Text 1.

Task 7

Read Text 2 using a dictionary. Be ready to answer the questions below the text.

Text 2

THE DEVELOPMENT OF COMPUTERS IN THE USA

In the early 1960s, when computers were hulking main-frames that took up entire rooms, engineers were already toying with the then – extravagant notion of building a computer intended for the sole use of one person. By the early 1970s researchers at Xerox's Polo Alto Research Center (Xerox PARC) had realized that the pace of improvement in the technology of semiconductors – the chips of silicon that are the building blocks of present – day electronics – meant that sooner or later the PC would be extravagant no longer. They foresaw that computing power would someday be so cheap that engineers would be able to afford to devote a great deal of it simply to making non-technical people more comfortable with these new information – handling tools in their labs,

Task 2

Read Text 1 and say what its main topics are. Title the text.

Task 3

Read Text 1 again and test your reading comprehension by choosing the correct statements:

1. Nearly everything we do in the world is helped or even controlled by computers.
2. Computers are less efficient than human beings.
3. Without software instructions, the hardware doesn't know what to do.
4. The basic job of the computer is transmitting information.
5. Charles Babbage was a professor of physics at Cambridge.

Task 4

Fill in the blanks with the words from the text:

1. The programming ..., Pascal, was named after Blaise Pascal.
2. This was the first known use of programmed ... which led the way to the concepts behind computers.
3. The all purpose problem-solving machine had a machanical ... to store the results of calculations.
4. The theory of Boolean logic became fundamental to the ... of computer circuity.
5. Computers are far more ... than human beings.
6. Computers can ... weather, ... chess, ... music.
7. Computer has no... by itself.
8. … is the term used to describe the instructions that tell the ... how to perform the task.

be increased. As a result, the fuel that is injected atomizes easily and burns cleanly, reducing exhaust emissions and increasing efficiency. In addition, the engine's **electronic control unit** can inject a small amount of diesel just before the main injection event ("pilot" injection), thus reducing noise and vibration, as well as optimizing injection timing and quantity for variations in fuel quality, cold starting, and so on.

Task 7

Look through Text 3 to understand what it is about.

Text 3

DIESEL FUEL

Diesel engines can operate on a variety of different fuels. Good – quality diesel fuel can be synthesized from vegetable oil and alcohol. Biodiesel is growing in popularity since it can frequently be used in unmodified engines, though production remains limited.

But most commonly used diesel is a product of the distillation of crude oil. A great variety of petroleum products result from this distillation process. About 36% of the end product is fuel oil (petrodiesel). The American Society of Testing Materials has established three standard grades of diesel fuel:

- Number 1 diesel fuel (No. 1-D);
- Number 2 diesel fuel (No. 2-D);
- Number 4 diesel fuel (No. 4-D).

Nos. 1-D and 2-D diesel fuels are used to power high-speed diesel engines, such as those in buses, automobiles, trucks and farm tractors. No. 4-D is for low-medium speed engines, such as those used in ocean-going vessels.

Diesel fuel is usually stored in aboveground storage tanks, underground storage tanks or fuel drums (barrels). In any case the containers should always be clearly labelled to prevent incorrect use of the fuel.

These are two major concerns involved in the storage of diesel fuel:

- avoiding contamination by water and foreign materials;
- avoiding conditions that cause gum accumulation.

Water, sediment, dirt and gasoline are the primary fuel contaminants that affect diesel engines. Carelessly handling diesel fuel is the primary way in which most of the dirt and foreign matter is introduced into diesel fuel.

Task 8

Read the text once again to answer the following questions:

1. What are the three standard grades of diesel fuels established in the USA?
2. What is the common way of storing diesel fuel?
3. What are the two major concerns involved in the storage of diesel fuel?

Task 9

a) Find the key words to speak about diesel fuel.

b) Speak about diesel fuel.

LESSON 8

Task 1

Read Text 1 and say what the two primary types of cooling systems for diesel engines are.

Text 1

THE DISEL COOLING SYSTEM

The cooling system of a diesel engine prevents overheating and regulates engine temperature. Only about forty percent of the heat energy from fuel is transformed into useful power. Another third is spent in exhaust gases. The remainder must be handled by

machine which was used to operate weaving looms. This was the first known use of programmed instructions which led the way to the concepts behind to-day's computers. Around this time Charles Babbage, a professor of mathematics at Cambridge University designed an all-purpose problem-solving machine which had a mechanical memory to store the results of calculations.

In the 1850's British mathematician George Boole realized that complex mathematical problems could be solved by reducing them to a series of questions which could be answered either positevely or negatively represented by either a 1 or a 0; thus the binary numbering system and Bodean logic was founded. This theory of Boolean logic became fundamental to the design of computer circuitry.

But none of the above-mentioned persons could even imagine the situation we find ourselves today. Nearly everything we do in the world is helped and even controlled by computers, the complicated descendants of the early machines. Computers are used more and more often in the world today, for the simple reason that they are far more efficient than human beings. They have much better memories and they can store much information. No man alive can do 500000 sums in one second, but a computer can. In fact computers can do many of the things we do, but faster and better. They can predict weather, and even play chess, write poetry or compose music.

Just as television has extended human sight across the barriers of time and distance, so the computers extend the power of a human mind across the existing barriers.

The term "computer" is used to describe a device made up of a combination of electronic and electromagnetic components. Computer has no intelligence by itself and is reffered to as hardware. By the way, "software" is the term used to describe the instructions that tell the hardwary how to perform the task.

The basic job of the computer is processing the information.

2. No man alive can do 500000 sums in one second, but a computer can.

3. Computer has no intelligence by itself and is referred to as hardware.

4. Software is the term used to describe the instructions that tell the hardware how to perform a task.

5. The data are raw material while information is organized, processed, refined and used for decision-making.

6. They have to pay for phone calls.

7. The data are constantly being directed towards its destination by special computers.

8. Nearly all the information being sent over the Internet is transmitted without any form of encoding.

9. There are still both commercial and technical problems which will take time to be resolved.

10. Programmers soon realized that it would be smarter to develop one programme that could control the computer's hardware which other programmes could have used when they needed it.

READING PRACTICE

Task 1

Look through Text 1 and say what it is about.

Text 1

As early as the seventeenth century, mathematicians were trying to create a machine that could perform basic mathematical functions such as addition, subtraction, division and multiplication, and around 1640, Blaise Pascal, a leading French mathematician, constructed the first mechanical adding device. The programming language, Pascal, which is widely used today, was named after Blaise Pascal to honour his contribution to the development of the modern computer.

1804 saw the introduction of an automated punched card

the engine cooling system.

The functions of the cooling system are as follows: to remove excessive heat in order to keep the engine temperature from exceeding 185°F; to prevent overcooling, with all the engine parts operating at, near or above 165°F, so that all parts fit and operate properly; to maintain a constant engine operating temperature. The ideal operating temperature for most diesel engines ranges from 165° to 185°F (74-85°C). An engine operating at the correct temperature wears less rapidly, burns less fuel and develops more power.

If engine heat is not quickly dissipated, the engine may be damaged. The entire engine may be ruined if overheating continues. Just as engines may be damaged by overheating, they can also be damaged by overcooling, that can lead to increased engine wear, improper lubrication, increased fuel consumption, increased engine corrosion. These conditions will result in lower power output and lower engine efficiency.

There are two primary types of cooling systems for diesel engines: air-cooling and liquid-cooling. The liquid (fluid)-cooling system is used on most automobiles, trucks and tractors.

A pressure liquid-cooling system consists of the following parts: water jacket, water pump, thermostat, coolant temperature gauge, radiator, pressure radiator cap, radiator shutter, hoses, fan, fan shroud.

The liquid-cooling system performs the following functions: absorption of heat, circulation of coolant, radiation of heat and control of engine temperature.

Absorption of heat refers to taking up heat from the engine. Burning fuel and the friction of moving parts generate heat in the engine, if this heat is not removed, the engine parts will fail. Heat is absorbed in the passages for coolant in the cylinder block and engine head, which are called the water jacket (Figure 8.1).

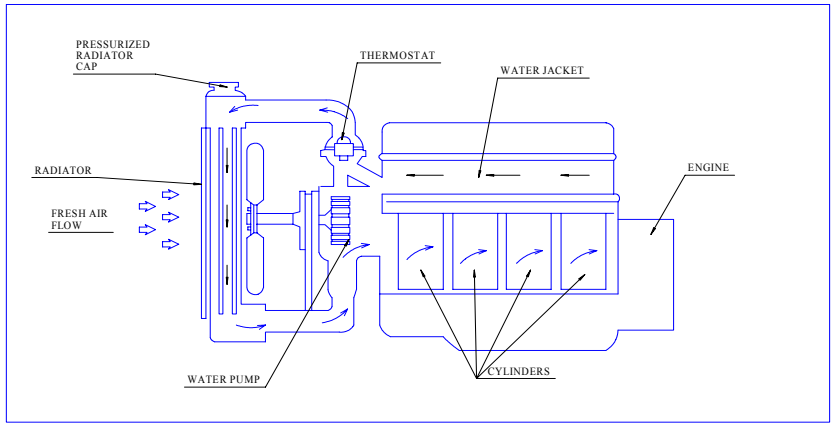


Fig. 8.1. The water jacket surrounds all of the cylinders with a liquid coolant.

Circulation of coolant is performed by the water pump, even though very few engines are cooled by water alone. Most engine manufacturers recommend a coolant made of ethylene glycol (Figure 8.2).

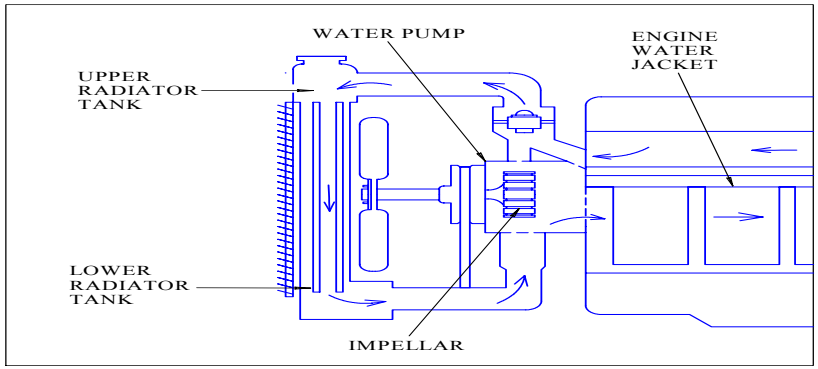


Fig. 8.2. The water pump is located at the front of the engine block.

Task 2

Pay special attention to the pronunciation of these international words; find their meaning:

Monitor [ˈmɔnɪtə], diskette [dɪsˈket], modem [moudem], video [ˈvɪdɪou], processor [ˈprousəsə], icon [ˈaɪkən], Internet [ˈɪntənet], command [kəˈma:nd], electronics [ˌɪlekˈtrɔnɪks], contract [ˈkɔntrækt], unison [ˈju:nɪzn], adapter [əˈdæptə], format [ˈfɔ:mæt], megabyte [ˈmegəbait], specialize [ˈspeʃəlaɪz], component [kəmˈpounənt], scanner [ˈskænə], computer [kəmˈpju:tə], microphone [ˈmaɪkroufoun], file [ˈfaɪl], provider [prəˈvaɪdə], site [saɪt].

VOCABULARY PRACTICE

Task 1

Say it in Russian:

Hardware, screen saver, system board, game, to retrieve, microwave, manual, to store, to type, driver, to refine, dot, instruction, to install, data, multitasking, to crash, interface.

Task 2

Say it in English:

Компьютер, символ, загружать, программное обеспечение, обрабатывать, дисковод, формат, стрела, клавиатура, мышь, обработка данных, совместимый, кнопка, экран, доступ, зависать, щелчок.

Task 3

Give Russian equivalents of the following sentences. Pay special attention to the grammar:

1. Nearly everything we do in the world is helped, or even controlled by computers.

38.	**memory**	память
	memory capacity (volume)	вместительность памяти
39.	**decision making**	принятие решений
40.	**floppy disk (diskette)**	дискета
41.	**hard disk**	жесткий диск
42.	**click**	щелчок
43.	**access**	доступ
44.	**to crash**	давать сбои
45.	**to release**	выпускать (новую версию программного изделия)
46.	**interface**	интерфейс (область взаимодействия между человеком и компьютером)
47.	**to browse**	просматривать, рассматривать
48.	**browser**	браузер (программа поиска информации)
49.	**multitasking**	многозадачный режим
50.	**to buzz**	зависать
51.	**icon**	пиктограмма
52.	**contents**	содержание
53.	**to slide**	скользить
54.	**to plug**	затыкать
55.	**to plug in**	вставлять штепсель (в розетку)
56.	**sign**	знак
57.	**bit**	бит
58.	**flip-flop**	мульти-вибратор, триггер
59.	**readout**	считывание
60.	**CD-ROM**	накопитель на компактных дисках

The coolant circulates through the engine until it reaches the operating temperature. At this time the thermostat opens, and the coolant is allowed to circulate and carry the heat to the radiator. Rubber hoses or metal tubes are used to carry the coolant from the engine to the radiator and back from the radiator to the engine. In modern engines the coolant may circulate at rates as great as 10,000 gallons per hour. Radiation of heat is the dissipation of heat from the coolant to the passing air. The radiator dissipates this heat, but the fan and fan shroud are also important. The fan shroud helps direct the air through the radiator, without it the air will take a different route. The radiator would be less effective in dissipating the heat if it were not for the fan moving air past the tubes and fins in the radiator (Fig. 8.3).

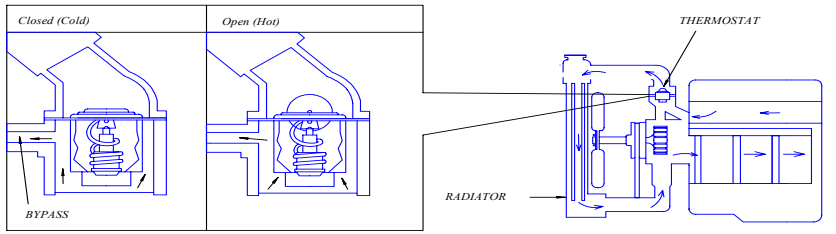


Fig. 8.3. The thermostat shortens the engine warm-up period.

Temperature control is primarily the function of the thermostat, a pressure radiator cap and radiator shutters are used on some engines to insure temperature control. A temperature gauge is also used to inform the operator of the engine temperature (Fig. 8.4).

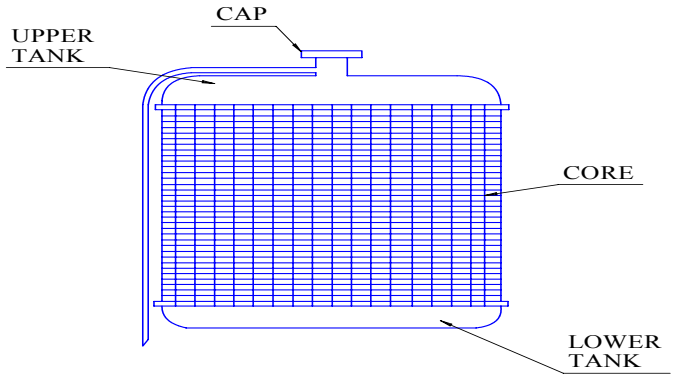


Fig. 8.4. A typical radiator design.

Task 2

Read the text using the Vocabulary and a dictionary. Be ready to do the following tasks:

a) Say what the main parts of a liquid-cooling system are.

b) Write out the special terms, state their functions and write them down next to the terms. Memorize the terms.

c) Find in the text the paragraphs which deal with:

1) the operating temperature for most diesel engines;
2) the effects of engine overcooling;
3) the water pump.

Translate the paragraphs into Russian.

d) Find in the text the sentence with an Absolute Participle Construction and translate it into Russian in writing.

e) Find in the text the conditional sentence and translate it into Russian in writing.

f) Answer these questions:

1) What are the two types of cooling system used in modern diesel engines?

2) What are the functions of the cooling system?

3) What is the ideal operating temperature range for most

10.	**button**	пуговица; кнопка
11.	**game**	игра
12.	**screen**	экран
13.	**screen saver**	режим отключения экрана при паузах в работе
14.	**arrow**	стрела
15.	**idle**	незанятый, (техн.) холостой
16.	**character**	знак, символ
17.	**dot**	точка
18.	**to evaluate**	оценивать
19.	**to process**	обрабатывать, перерабатывать
20.	**processing**	обработка данных
	processing hardware	устройства обработки данных
21.	**to boot**	загружать
22.	**to store**	запоминать, хранить
23.	**to display**	выставлять, показывать
24.	**manual**	1) справочник, руководство 2) ручной
25.	**remote**	дальний, отдаленный
26.	**procedure**	образ действия
27.	**data**	данные
28.	**to retrieve**	извлекать информацию
29.	**microwave**	микроволновый
30.	**to install**	устанавливать
31.	**to type**	печатать
32.	**to refine**	очищать
33.	**strain**	натяжение, напряжение, нагрузка
34.	**to respond**	отвечать
35.	**instruction**	команда
36.	**compatible**	совместимый
37.	**to accept**	принимать

UNIT 2
USING THE COMPUTER

Nowadays computers are being widely applied in all the production spheres, and agriculture is one of them. Modern tractors and combine harvesters control systems now use computers. That's why modern specialists should be able to work on a computer.

We believe the information of this Unit will be of great help to you in competent using the computer.

ACTIVE VOCABULARY

Task 1

Read these words. Try to memorize them and their Russian equivalents:

1.	**hardware**	аппаратное обеспечение,
	input hardware	оборудование, "железо"
	output hardware	устройство ввода данных
	storage hardware	выходные устройства, отображение информации
		устройство хранения данных
2.	**software**	программное обеспечение, компьютерные программы
3.	**board**	доска
	system board (main board)	системная (материнская) плата
4.	**key**	клавиша
5.	**keyboard**	клавиатура
6.	**drive**	дисковод
7.	**driver**	программа управления устройствами
8.	**mouse**	мышь

diesel engines?

4) What are the effects of engine overcooling?

5) What coolant is recommended by most engine manufacturers?

Task 3

Write an annotation of the text in English.

Task 4

Read Text 2 to answer the given questions:

1) Why is it imperative to service and maintain the cooling system?

2) What is an important part of the daily servicing of a liquid-cooled diesel engine?

3) What is the easiest way to avoid corrosion?

Text 2

SERVICING THE COOLING SYSTEM

The diesel engine cooling system is extremely important to the proper functioning of the engine. It helps prevent the engine from overheating and regulates the engine temperature. Therefore it is imperative to service and maintain the cooling system so that the engine can warm up as quickly as possible and maintain the correct operating temperature - regardless of the load.

An important part of the daily servicing of a liquid-cooled diesel engine is checking the coolant level.

It is also important to prevent and remove corrosion. The most common contaminants of coolant that can corrode the cooling system are acids from exhaust gas leakage, dissolved minerals in the water and oxygen from the air. Iron corrosion from using untreated water makes iron rust the principal problem in the loss of heat transfer and the clogging of radiators and water jacket.

Hard water is also dangerous. The easiest way to avoid corrosion is to use soft and treated water to fill the radiator.

Task 5

Render the text in Russian.

Task 6

Speak about the Diesel cooling system. Do it in pairs. Thoroughly think over your questions and answers.

LESSON 9

Task 1

Read the title and the second paragraph of Text 1 and list the functions of the diesel lubrication system.

Text 1

THE DIESEL LUBRICATION SYSTEM

All engines – whether spark – or compression-ignition, liquid – or air - cooled, single – or multiple-cylinder, two-or four-cycle-must be lubricated properly or they will not continue to operate long. The primary function of the engine crankcase oil is the lubrication of the engine's moving parts.

The lubrication system in the modern diesel engine performs the following functions: reduces shock, reduces wear, reduces friction, seals compression, provides some cleaning, helps cool the engine, quiets the engine operation.

There are three basic types of lubrication systems used in internal combustion engines: splash, pressure and splash, full pressure. In the splash system a dipper attached to a connecting-rod splashes oil about the crankcase to lubricate the bearings and cylinder walls and wash down the crankcase walls to provide some engine cooling (Figure 9.1). Some parts of the engine may receive lubrication in the form of an oil spray, while others depend on

dent at Cal Tech in California, that a service center operating diesel-powered equipment in Pasadena would wish Russian students who have some courses in mechanics to work with the company this summer. You are very interested in the possibility of such a practice and decide to apply for the job. You should write letters of application and resume (you can use the before – prepared versions). Some of you are interviewers who come to your city to meet with the applicants. Each applicant is to speak to the interviewers in person. The most successful applicants are invited to the USA for three months.

Characters:

1. Interviewer, the Service Center Supervisor Mr. John Simpson.
2. Interviewer, the Service manager Mr. Edward Collins.
3. Interviewer, the Staff manager Mr. Richard Best.
4. Applicants, students of the Bashkir state agrarian university with their real names and life stories.

Now thoroughly think over your questions to each other, and be happy to answer them. Don't forget the information on what you should do and what you shouldn't do during an interview.

nervous tremor and shortness of breath;

answer all questions and do it honestly. Don't be afraid to speak about your failures but try to stress that you can get over them;

try to convince your interviewers that you don't lose your head in a difficult situation and on having analyzed it your are able to make the right decision;

speak deliberately and concretely;

look right into the eyes of the person you are talking to, your language should be lucid and your thoughts should be accurate.

You shouldn't

write incorrect information on you resume (CV) to make it look better;

be one who knows everything and can do everything; but who can't take instructions;

arrive late for an interview and be untidy in appearance;

always say that you need a job very much;

render a confused story;

at once start asking about your salary, working hours and so on;

forget to thank the persons for the interview even if they are unable to comply with your request.

Now you're welcome to work in pairs. You can ask questions about the reasons a person may be looking for a job; interpersonal qualities, education, knowledge of foreign languages, computer skills, previous working experience an applicant should have to get a good job. Start working.

ROLE PLAY

The situation is as follows: you are third year students at the farm mechanization department of the Bashkir State Agrarian University. You have heard from your friend, who is now a stu-

gravity for the oil to flow to them through ports or lines. For the splash system to work the oil must be fluid enough to be splashed about. For this reason it is important to use oil of the viscosity recommended by the engine manufacturer. The pressure and splash system uses a pump to force oil to a main oil gallery, then through passages to bearings, tappet lever shaft, filter, connecting rod and camshaft bearings, and a pressure sensing unit. As the oil escapes from the bearings, a mist is created, which lubricates the pistons, piston pins and cylinder walls. In the fuel-pressure systems, pressurized oil is forced to the piston pins through the connecting rods to the cylinder walls. Oil is also forced to the main bearings, crankshaft and connecting-rod bearings, tappet lever shaft, filter and oil-pressure sensor (Figure 9.2).

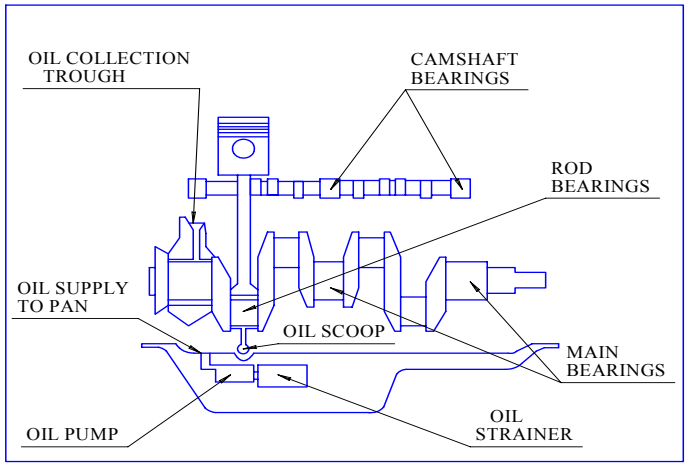


Fig. 9.1. A pressure and splash-type lubrication system.

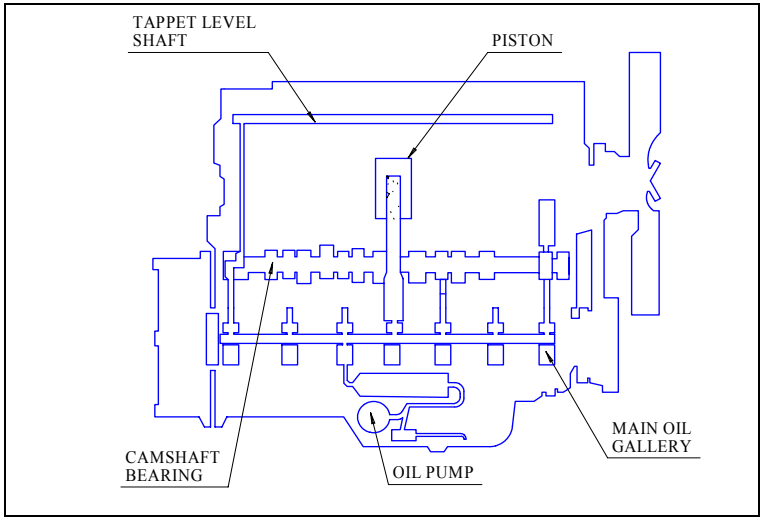


Fig. 9.2. A full pressure-type lubrication system.

Task 2

Read the last paragraph of the text and divide it into 4 parts. Title these parts.

Task 3

Read the text using the Vocabulary and a dictionary and translate the passage about the pressure and splash system into Russian in writing.

Task 4

Find in the last paragraph of the text all sentences with the Infinitive, state their functions and translate the sentences into Russian in writing.

Task 5

Look through the text again to answer the following questions:

1) What are the functions of the lubrication system in a

strained, discreet, easily carried away, persistent, purposeful, thoughtful, rational, generous, shy, frank, practical, reasonable, self-possessed, polite, strong-willed, emotional, with a sense of humour, good mixer.

Other characteristics may be used, too.

HOW TO BEHAVE DURING AN INTERVIEW

If you ask most job applicants, they will agree that good news comes over the phone and bad news appears in their mailbox.

If you are lucky, you will be telephoned in some days after having sent your letter of job application and asked to come down for an interview.

Interviews are usually conducted by one or by several officials. The interview is an opportunity for you to discuss your background qualification and aspiration with the interviewers, to supply any further information about yourself, and to convince the officials to consider you as a serious candidate.

Your behaviour during an interview is, perhaps, one of the most important moments in getting a job.

Here are some pieces of advice on what you should do and what you shouldn‘t do during an interview given by professionals:

You should

learn as much as possible about the company you are going to deal with;

apply for a job in person and have a perfect resume;

be in a good mood, well-groomed and appropriately dressed. It should be business style;

be ready to speak about yourself: stress your qualification for the job opening, mention any experience you have which is relevant to the job;

indicate your stability, flexibility and readiness to learn;

maintain your poise and self-control, try to overcome

PROFESSIONAL TRAINING	2001-2004 Autotransport College 2004-2005 Computer courses
WORK ING EXPERIENCE	2005, 2006 (summer) Service manager assistant at the Service centre in Ufimsky district of the RB
COMPUTER SKILLS	Word, Excel, Power Point
LANGUAGES	Communicative English, translating and interpreting skills
INTERPERSONAL QUALITIES	Adaptable, reliable, energetic, well-organized, flexible, friendly, honest, responsible, communicative, willing to retrain, intelligent
INTERESTS	Reading, sport, music, computer
OBJECTIVE	A position which provides gaining the necessary practical experience for the work on graduating from the University
REFERENCES	Available upon request

2. Write your own resume (CV). In case you need some additional words (word combinations) to describe your interpersonal qualities you can choose from those given below. If you have some difficulties with their interpretation, use a dictionary: hardworking, energetic, (un)communicative, reserved, independent, kind, modest, resolute, man of decision, loyal, strict, patient, industrious, careful, punctual, cheerful, (un)sociable, re-

diesel engine?

2) What are the three types of lubrication systems?
3) Why is it important to use oil of the viscosity recommended by the engine manufacturer?
4) What is the function of a pump in the pressure and splash system?
5) What are the parts of an engine to be lubricated?

Task 6

Find in the text the special terms to describe the three types of the lubrication system in the modern diesel engine. Make a chart and fill it with these terms. Mind the logical connection of the notions.

Task 7

Speak about the lubrication system in a diesel engine. Do it in pairs. Thoroughly think over your questions and answers.

Task 8

Read Text 2 to answer the following questions:

1) What are the two most important characteristics of oil for a tractor, truck or other power equipment?
2) What is viscosity?
3) What oils are labelled single-grade oils?
4) What is a multi-grade oil?

Text 2

Most of the lubricants used in modern diesel engines come from petroleum, although some are derived from animal or vegetable oils and are called synthetic oils.

A lubricant for a tractor, truck or other power equipment must be able to perform its functions under a variety of tempera-

ture conditions to protect the engine parts at a variety of pressures and speeds. Therefore, the two most important characteristics of oil are viscosity and its service classification.

Viscosity is a measure of a liquid's resistance to flow. Oils that meet only one temperature specification are labelled single-grade oils. Oils that meet specifications for more than one temperature are called multi-grade oils; these can be used at wide temperatures ranges.

Task 9

Write a summary of the text in English. Title the text.

Task 10

Look through Text 3:

a) State its character;

b) List the operations which are needed to service the lubrication system in their correct order. Do it in Russian.

Text 3

SERVICING THE LUBRICATION SYSTEM

To service the lubrication system, proceed as follows: warm up the engine before changing the oil and filter; position the container for the waste oil below the crankcase drain plug; remove the plug and allow the crankcase to drain; replace the drain plug; find the oil filter, clean the base of the filter; loosen the filter; remove and discard the oil filter; refill the crankcase with oil; operate the engine and check for leaks; stop the engine and make sure, that the oil level is correct; find the crankcase breather, remove it, wash the filter element, reinstall the breather.

- Further to the above…. In addition to the above…. - В дополнение к вышеуказанному.

- It is self - understood…. It goes without saying…. - Само собой разумеется.

- The matter is…. The point is…. - Дело в том, что….

- In the circumstances …. - В сложившихся обстоятельствах….

- You early reply will be appreciated. – Буду признателен за быстрый ответ.

- I am looking forward to hearing from you. – Надеюсь получить Ваш ответ в ближайшем будущем.

- Please inform me (let me know) in the shortest possible time. – Прошу сообщить, как можно скорее.

- I would like to assure you…. – Хотел бы заверить Вас….

- Yours sincerely. Sincerely yours. Yours faithfully. Faithfully yours. Yours truly. Truly yours. – С уважением.

HOW TO WRITE YOUR RESUME (CURRICULUM VITAE)

1. Read the resume (Curriculum Vitae) and try to get some information for writing your own one.

NAME (First, Last)	Aleksandr Tkachenko
DATE OF BIRTH	15 November 1983
HOME ADDRESS	450083, Ufa, R. Zorge St., 31-65 Russia
TELEPHONE NUMBER	(347) 225-25-68
MARITAL STATUS	Single
HEALTH	Excellent
EDUCATION	A fifth-year student at the farm mechanization department of the Bashkir State Agrarian University

chanic at the service center in Karmaskalinsky district of this republic. I think at present any role would suit. Further to the above I'd like to mention that I attend optional classes in English at the University, and I hope my knowledge of the language can be of some help to you, too.

I have enclosed my CV for your attention. If there is a position available this summer, please telephone me on 232-98-30. I will be more than willing to come down for an interview.

I am looking forward to hearing from you soon.

Yours sincerely,

Robert Gareyev

3. Your letter of job application can also be sent both to the USA and England. Pay attention to the way they write the address in these countries:

Mr. I.C.Poffenberger Staff Manager Modern Machine Tool Co 2172 Demington Drive Cleveland Heights Ohio 44106 USA	Mr. G. Nelson Product Information Manager Smith &Co Ltd. 25 Leadenhall Street London EC England

Now imagine your own situation and write a suitable letter of job application. The following expressions can help you do it:

- With reference to your advertisement in Internet (– http://www.agrilabourpool.com, 20 …) I'd like to apply for the position of… in your company. - Ссылаясь на объявление, в Интернете (http://www.agrilabourpool.com, 20 …), я хотел бы претендовать на должность… в вашей фирме.

LESSON 10

Task 1

Below you will see Text 1 "Importance of Cleaning the Engine":

a) Before reading the text try the predict what information you will find in it. Mind that diesel engines are used in farm equipment.

b) Look through the text to find out if you are right.

Text 1

IMPORTANCE OF CLEANING THE ENGINE

A new engine is clean and painted in an attractive color. As the engine operates, oil escapes through leaks in gaskets or at connections of various fittings. Oil that escapes onto the outside surface of the engine collects dust, and the accumulation of dust and oil insulates the engine and keeps it from cooling properly. An engine may also collect crop residue, livestock bedding and hay in the grill.

Besides oil, grease and dirt particles, a diesel engine in farm equipment is exposed to such materials as manure, fertilizers, pesticide sprays, antifreeze, crop dusts, road sprays and de-icers. If such a mixture is allowed to remain on the engine indefinitely, the paint may soften or scale. Chemicals will deteriorate the painted coating on the engine.

From the operator's viewpoint, the following reasons justify regular cleaning of the engine:

- A clean engine reflects good management, implies quality servicing and demonstrates pride of ownership and pride in work.

- Cleaning the engine helps protect paint and parts that are affected by grime accumulated on the engine.

- Cleaning removes chemicals that may damage the engine.

- With a clean engine, there is less chance for dirt to enter the fuel tank, cooling system and hydraulic system during servicing.
- Cleaning the engine helps reveal leaks in the cooling system or fuel system, cracks in the manifold or engine block and loose parts around the engine.
- A clean engine improves safety.

Task 2

Read the text and name at least 4 reasons for keeping an engine clean.

Task 3

Read the text using the vocabulary and a dictionary and translate the passage about the reasons justifying regular cleaning the engine.

Task 4

Read Text 2 and say

a) what methods are usually used for cleaning the engine,

b) what cautions should be paid attention to when cleaning the engine.

Text 2

CLEANING METHODS

Compressed air is sometimes used to blow dirt off the surface of the engine, the cooling fins of the radiator and so on. However, compressed air will not remove accumulated dirt and grease that has been baked on by the heat of the engine.

High-pressure washer is used by many operators to remove dirt and grease from the surface of the engine.

HOW TO WRITE A JOB APPLICATION

1. Below you will see a sample job application letter. Before reading it try to predict what information you will find in it, i.e. what information should be included in such an application. Choose from the following statements:

1. The person writes to enquire about the possibilities of employment with the company.
2. The person tells about his childhood.
3. The person writes about his relatives.
4. The person offers a variety of practical skills.
5. The person writes about his professional experience.
6. The person describes his working day.
7. The persons tells about the books be likes to read.
8. The person gives his telephone number.

2. Read the Letter of Job Application and see if you are right:

Robert Gareyev
450071 Ufa
Mendeleyev St., 201-75
Russia

Dear Mr. Strelkov:

I am a third-year student of the Bashkir State Agrarian University. I am at the farm mechanization department.

I know that you are the head of the MTS "Bashkirskaya" in Ufa. I am writing to inquire about the possibility of employment with your company this summer. I can offer a variety of skills in the field of diesel engines servicing, agricultural tractors and machinery maintenance.

Last summer I worked as a helper to an experienced me-

3) to dramatize the situation.

PART III
BUSINESS ENGLISH

UNIT 1
MAKING A CAREER

Knowledge and training in the field of diesel engines, agricultural tractors, machinery and implements open a broad range of career opportunities to the person interested in diversified work experience, future promotion, and world travel. This field is in constant need of technically qualified workers. Specialists in this field are needed in all parts of the world, and a skilled technician can usually choose the work location desired. Increased wages, improved working conditions, opportunities for additional study, and advancement are available to interested and dedicated persons who conscientiously work in this field.

Years go by, and, perhaps, you now reading these lines, will soon have to look for a job. The purpose of this Unit is to teach you how to write a letter of job application (Letter of Inquiry or Covering Letter), and resume (Curriculum Vitae). Mind that resume (Curriculum Vitae) is a written summary of your personal, educational and professional data, your interpersonal qualities, skills, working experience and interests. It should be short, but detailed, and it should show you to a good effect, like a "product on sale". On having read your resume (CV) your possible employer should be willing "to buy" you. Remember that this document may prove crucial for your future because you are likely to be asked to present it not only when you apply for a job, but when you wish to continue your education, too.

In this Unit you will also learn how to behave during an interview and you will be provided with some information on what you should do and what you shouldn't do during an interview.

Caution: Do not use cold water on a hot fuel injection pump.

Repair shops use steam cleaners to remove dirt. However, a steam cleaner has a tendency to remove paint from the surface of the engine as well.

Caution: Do not use steam or a high-pressure washer to clean the viscous drive on the fan.

An engine can also be cleaned by using a commercial solvent, kerosene or diesel fuel.

Caution: Do not use gasoline. It is a fire hazard.

LESSON 11

Task 1

Look through Text 1 and say if it is about:

a) one of diesel engines systems;
b) the use of diesel engines;
c) the advantages of diesel engines over gasoline engines;
d) one of diesel engines designs;
e) diesel-engined tractors;

say what the main information units of the text are, title the text.

Text 1

Volvo engines are a smart decision. They do a superb job of keeping fuel temperature regulated, allowing them to operate more efficiently for better fuel economy and lower operating costs. The Engine fuel systems are divided into low-and-high-pressure zones. The high-pressure zone injects fuel into the cylinders. The cam actuates the injector plunger and produces the high

pressure needed to inject atomized fuel for an efficient burn.

Injectors feed fuel to the engine based on volume. Heated fuel is less dense, and, therefore, engine performance decreases as fuel temperature increases. This can be compensated by adding fuel coolers, adding both cost and complexity.

Volvo engines do not require fuel coolers. Their system draws fuel from the tank through a 20-40 micron primary filter. The excess fuel from the injectors is mixed with incoming fuel and pumped through a 3-5 micron secondary filter. The fuel is then sent to the injectors at the rear of the cylinder head.

Because Volvo System draws only the amount of fuel needed for combustion, the fuel temperature is not heated with large amount of return fuel. The recirculated fuel temperature is maintained by engine coolant, which has better regulation than return fuel.

The Volvo engines filters have the following key features: best possible operating conditions, reliability, long service life, economy – they are easy to install and work with no special training or tools, security, availability.

The Volvo Engine Brake (VEB) technically consists of two pieces working together – the Volvo compression brake and the exhaust pressure governor. The five key features of the Volvo engine brakes are: higher – braking effect at 1600 rpm and below for better vehicle control; its quiet, increasing usage and reducing operating costs; its light weight, offering, increased payload; it's not affected by altitude, providing the same braking performance, whatever your location; its quick response helps to keep the vehicle under control.

Volvo is the only North American manufacturer to offer a side-mounted PTO. The pump is located in a protected area with the hydraulic lines safely routed above or within the frame-rail. It's the ideal solution for operators who need auxiliary power to perform multiple tasks while "on the go".

It's controlled by a bypass valve, which acts as an on/off

January 19, 20…
Dr. Graeme R.Quick,
Conference Coordinator
Iowa State University
200 Davidson Hall
Ames
USA

Dear Dr. Quick:

Thank you very much for you letter of 12 January, 20…, inviting me to attend and present a paper at the International Conference on "Crop Harvesting and Processing". I am very interested in the subject of this conference and will be pleased to give an invited paper "Harvester Design, Development and Testing". An abstract of my paper will follow.

Sincerely yours,
…

Mind that information presented in an abstract of a paper (тезисы доклада) usually includes a description of:

a) the research subject;
b) the methods used;
c) the results obtained.

Write your own abstracts.

Now when you have answered the invitation to attend the conference and your abstracts have already been written your tasks are:

1) to choose the person who will chair the conference and the persons (3) who will chair the workshops (sections), the rest of you will be the speakers at the conference;

2) to get ready for dramatizing the roles;

January 12,20…
Mr … ,
Bashkir State
Agrarian University
50-let Okctyabrya St.,
Ufa, 450001,
Russia
Dear Mr. …

On behalf of the Organizing Committee I would like to invite you to the International Conference on "Crop Harvesting and Processing" which will be held in Louisville, Kentucky, USA, from 10 to 12 February, 20…. It is organized by ASAE and co-sponsored by CIGR, among others. The conference is subtitled "A Global Symposium on Engineering Aspects of Harvesting, Handling, and Processing of Grains, Hay, Forage, Biomass, and Other Crops". In view of your active interest in this field, I would like to extend to you an invitation to present a paper on a subject of choice. An abstract of your paper and an early reply will be appreciated. Further information is available from: Dr Graeme R.Quick, Conference Coordinator, Iowa State University, Agr. and Biosystem Eng. Dept 200 Davidson Hall, Ames, IA50011-3080
Phone 515.294.1320 Fax: 515.294.6633
E-mail: grquick@iastate.edu.

Sincerely yours,
Graeme R. Quick

Now each of you should write a letter to the Organizing Committee accepting the invitation to participate in the conference. You can use the Sample letter given below:

switch. The valve engages the hydraulic system only when you need it and is operated by an instrument panel mounted switch. This lets you perform multiple tasks while on the move for lifting, pumping, dumping, spreading and plowing. It makes your work more productive and more profitable.

Our PTO is available as a factory mounted option, ensuring the same high quality installation standards you expect from Volvo.

In conclusion we can say that Volvo's engine design meets new emission requirements while providing Volvo owners with optimized fuel economy, no loss in engine performance, fewer changes in maintenance procedures, no significant weight increase and less expense over the life of the vehicle.

Task 2

Read the text using the Vocabulary and a dictionary to answer the question "Why are Volvo engines a smart decision?".

Task 3

Find in the text the paragraph describing the Volvo Engine Brake and translate it into Russian in writing.

Task 4

Name the five main Volvo engine characteristics.

Task 5

Find in the text the key words which can be used to speak about the advantages of Volvo engines.

Task 6

Say if the information of the text seems interesting to you. Why?

Task 7

Read Text 2 and comment on its contents. Pay specially attention to the electronically regulated turbo compressor and injection with variable rotation. You can use the Vocabulary and a dictionary.

Text 2

THE NEW D5 VOLVO ENGINE

The D5 engine has a turbo compressor from the latest generation, with electronic control for fast and precise regulation of the charge pressure. A large compressor wheel provides high torque and output. The variable vanes are angled for an efficiency flow of gas and a high level of efficiency. This results in both quick acceleration and good high – speed performance. The turbo housing is water – cooled, which is unusual in diesel engines. This provides continued cooling when the engine has been switched off. The electronically controlled turbo enhances power with no noticeable torque threshold, which contributes to good driving comfort.

The air swirls in the cylinders combustion chambers. A throttle is used to freely regulate air swirl, and combustion is very precisely adjusted to the driving situation and the current load on the engine. Large combustion chambers result in low compression, thereby providing both high performance and low emissions. The injection system has injectors with seven nozzles. This results in finely atomized fuel mixture and efficient combustion. Injection takes places in the three stage pre – injection, primary injection and post injection. The last stage burns soot particles in the exhaust gases. An electronically controlled glow plug system results in shorter glow times, making it easy to start the engine in cold weather.

The D5 engine has the latest generation management systems, with high capacity and a great number of sensors that pro-

- Unfortunately, I cannot agree with your approach (your final statement);
- Our results show the opposite;
- We came to other conclusions;
- I don't agree with the way you've presented the problem (question);

c) to make comments:

- I have a comment (I'd like to comment);
- I want to make some remarks on Dr. Brown's paper;
- I would like to comment briefly on two points raised in his talk by Dr. Lane;
- Let me clarify the suggestion proposed by my colleague;
- I my opinion we should analyze this problem more thouroughly;
- In this connection I want to give you my views on this subject (problem, question);
- I think it is useful to discuss some of the ideas which have emerged from this conference (seminar);
- I have several things to criticize;
- I uphold this suggestion;
- I world like to put forward an amendment;
- I would like to voice my opinion.

Task 2

Read the text "A Paper at a Scientific Conference" (Unit 1, Task 1) again and express your agreement or disagreement with the speaker, make your comments.

ROLE PLAY

Imagine you are a post-graduate at the chair of Farm Machines and you are invited to take part in an International Conference. You have received the following personal invitation:

UNIT 3
DISCUSSION

Discussion is aimed at clearing up a problem by presenting, considering and assessing various view points, opinions, approaches, etc.

Task 1

Study some phrases which you can use

a) to agree with the speaker:

- That's right;
- You are right;
- I agree with you (the speaker);
- I agree with your conclusion (your point of view, your arguments, your opinion);
- I fully agree with your remarks (the way you've presented the problem);
- I am of the same opinion;
- I find your suggestions very interesting;
- This is a very good example (important method, interesting idea);
- A believe it is a reasonable explanation;
- I'd like to support Dr. Brown's suggestions to develop a common approach to the investigation methods;

b) to disagree with the speaker:

- I am not sure about that;
- I have some doubt about that;
- That is only partially true;
- I am not sure that this approach is justified from the ecological point of view;
- I'm afraid I didn't quite understand your definition;
- I don't agree with you (your point of view, your opinion, your arguments);
- I can hardly agree with you;

vide extremely precise control of the engine functions. Among other things, both the throttle and the Exhaust Gas Recirculation (EGR) valve are electronically controlled to precisely regulate air supply and exhaust gas recirculation. An EGR cooler lowers combustion temperature very effectively, and reduces emissions. The catalytic converter is connected close to the engine to heat it quick and start the cleaning process. It has been supplemented by an oxygen sensor that precisely regulates fuel mixture and emissions.

Task 8

Advertise Volvo engine design. Do it either in Russian or in English.

Task 9

Read the title of Text 3 and say what engine is described in it.

Task 10

Now read the text using the Vocabulary and a dictionary to answer these questions:

1. What do the improvements to the proven Cummins diesel engine provide?
2. What is the function of a gear driven injection pump?
3. In what way are quieter operation and improved cold start capability provided?
4. What is the compression ratio in the engine?
5. What device is used for cold starting?
6. Where do air cleaner housings mount?
7. What are the main peculiarities of the fan drive?

Text 3

CUMMINS TURBO DIESEL ENGINE

Extensive improvements to the proven Cummins diesel engine for the 2003 model year provide more power and torque, noticeably quieter operation, reduced maintenance and reduced exhaust emissions.

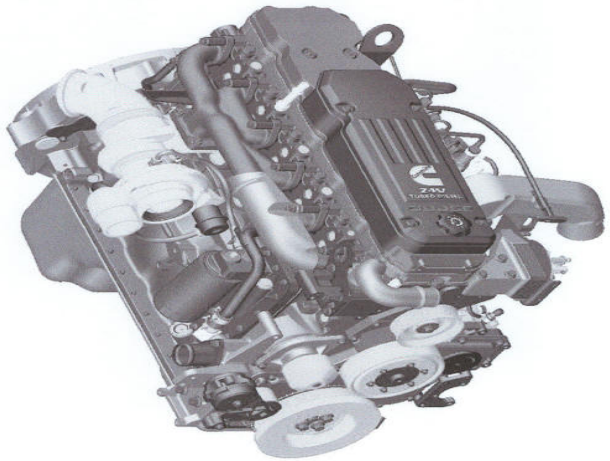


Fig.10.1. Cummins Turbo Diesel Engine.

The engine responds faster to changes in accelerator pedal position as a result of Cummins' proprietary engine control system and a state of the art common-rail electronic fuel injection. A gear driven injection pump delivers a fuel to the rail that is electronically controlled to optimize fuel pressure at the individual injectors. The system provides injection pressures up to 23,200 psi (1600 Bar) that are less dependent on engine speed than the traditional pump-line injection system. The result is cleaner combustion and higher low speed torque with better vehicle response and

really to the point.
That's completely irrelevant, I'm afraid.
This point is not under discussion today.
Let's go back to our original question.
I'm afraid we are moving away from the main problem.
Will you keep to the point, please? Don't digress.

- I think we should now consider….
  And now we proceed to the next/last point (question)….
  I think we could move to the next point under discussion.
  The discussion will be continued tomorrow morning.

Task 4

Summing up the discussion and closing the session is the last function of the chairperson.

Now study the phrases which can be used in closing a discussion:

- Now it is time to sum up the discussion and suggest conclusions;
- I would like to make a few remarks at the end of this discussion;
- In conclusion I'd like to say that we have covered a very complex area in a remarkably short space of time;
- Well, I think I must thank the speakers for their most interesting and most informative presentations.
- I thank everyone present here today for being active in our discussion. And to conclude our today's meeting I must say it has been stimulating and professionally rewarding. I declare the meeting closed. Thank you.

chairperson is to start a discussion. Conducting a discussion involves the following functions of the chairperson:

- opening a discussion;
- stimulating the discussion;
- keeping things moving;
- bringing the discussion back to the point;
- stopping the argument.

Now read the following groups of phrases which can be used by the Chairperson and put them in the right order according to the functions mentioned above:

- I'm afraid you'll just have to agree on that point.
  There seems to be some conflict between your points of view. Let us stop the discussion.
- Now I would like to open the discussion.
  Please feel free to ask questions and make comments.
  Now let us proceed to the discussion. I would like everyone to be brief and keep to the point.
  Now we are going to discuss the papers presented. I wish you a useful exchange of ideas and opinions.
  May I have your attention, please?

- Are there any questions to Dr. A?
  Any questions to professor B.?
  Any questions or comments?
  Would anyone else like to speak?
  Dr. C., what do you think about the question?
  Who has anything to add?
  Is there anyone who would like to answer the question in more detail?

- That's very interesting, but I don't think it's

acceleration. Cummins' controls and the electronic fuel injection ensures that the engine combines optimum fuel economy and performance with emission control capabilities to meet increasingly stringent emissions regulations. In addition, the common-rail architecture and electronic controls are capable of providing new features, such as multiple injection pulses, and independent control of injection pressures. This provides both noticeably quieter operation and improved cold start capability. The engine shares a higher compression ratio that contributes to the increased power and torque. For the standard-output engine, the increase to 17.2:1 is almost one full ratio.

Improved combustion and fuel systems management, and a higher compression ratio provide better cold starting capability at extremely cold temperatures. Benefits include: reduced wait-to-start" times up to 15 seconds less at temperatures below 20 °F (7°C), significantly reduced cold cranking times, reduced manifold heater power consumption.

For cold starting, the engine continues to use an electronically controlled intake air heater grid, mounted at the inlet to the intake manifold, that is inherently more reliable than the glow plugs used in competitive engines. A larger air cleaner assembly and filter are used because of the higher air consumption of these engines. As in 2002, the air cleaner housing includes a Filter Minder™ device to help determine when the filter needs to be replaced. Both air cleaner housings mount on the frame rail in the right front corner of the engine compartment.

An electronically controlled viscous fan drive is included with the Cummins Turbo Diesel engine. It reduces noise and fuel consumption, compared to the prior thermostatically controlled viscous drive system, when added cooling air provided by the fan is not needed. This form of control also allows the use of a larger fan than in the past to maximize cooling under extreme conditions. The fan can consume up to 25 horsepower at high rpms. The PCM operates a solenoid valve on the fan drive that controls flow of the

viscous material, determining when fan engages and disengages and also how fast it turns.

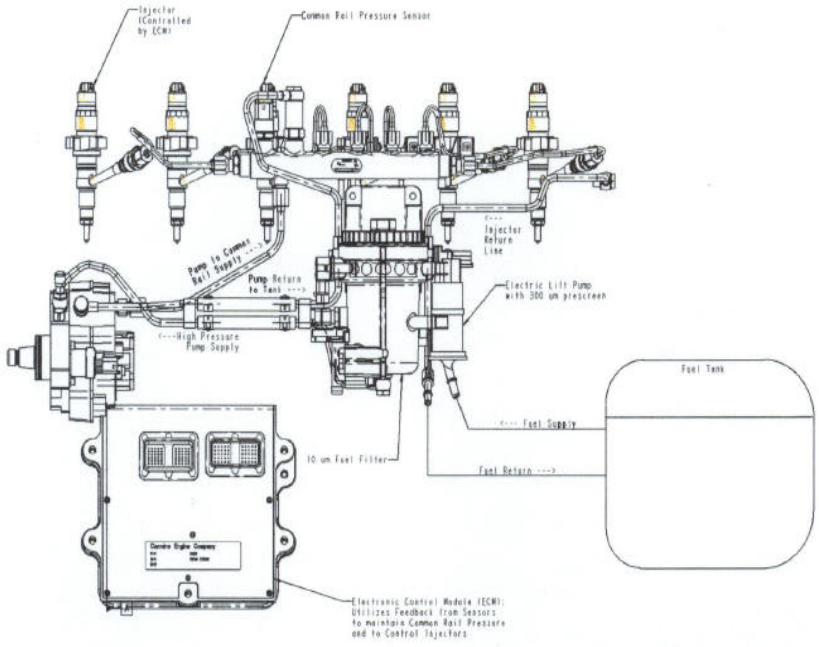


Fig.10.2. High – pressure Common Rail fuel injection system.

Coolant temperature and air conditioning refrigerant pressure are the primary inputs that determine fan operation. Previously, only underhood air temperature was used to determine whether the fan ran or not. Electronic control also enables electronic diagnostic capabilities for fan drive operation. Viscous coupling of the fan to the engine continues to limit fan speed at high engine speed.

former Secretary-General of CIGR, awarded the title of Doctor honoris causa at the University of Agricultural Sciences of Godollo, Hungary, for his work in connection with labor organization. Soon he will publish a comprehensive Handbook of Agricultural Engineering. The book includes up-to-date technologies related to agricultural engineering. Dr.Daelemans' presentation is concerned with the problem of machines for crop production.

- The first speaker (the first person to speak, the next speaker the last one to speak) is Professor Salokhe, who is currently working as Professor of Agricultural Engineering at the Asian Institute of Technology in Bangkok. He is known for his research in agricultural soil mechanics specially for paddy soils. He has published extensively in international refereed journals and in conference proceedings. He is also a recipient of 16 awards for his professional contributions. Prof. Salokhe, please take the floor.

c) Study some phrases you can use to thank a speaker and assess the presentation:

- Thank you, Professor Salokhe, for your highly interesting talk. Your paper rises an important problem of ….
- I am sure I am speaking for everyone when I say how grateful we are to Dr. Daelemans for his informative report covering various aspects of the problem discussed.
- Dr.Stout, I am very impressed by your talk. It was a comprehensive account of the state of things in…. Thank you very much.
- Dr. Kitani has given a very complete analysis of…. On behalf of the audience I thank him.
- What you have reported here, Dr. Backham, is really very interesting. I am sure the problem you have raised will promote comprehensive discussion.

Task 3

When the presentation of all the papers is over the chairperson is to start a discussion. Conducting a discussion

Text 2

OPENING SPEECH FOR A WORKING GROUP SESSION

As the chair of this session, I welcome all of you to this workshop. It is our intention to discuss here various aspects of the problem of soil cultivation. There are 7 papers on the agenda. The session will be arranged as follows: first I will introduce all the speakers, then they will make their presentations. Each speaker is allowed twenty minutes to develop his subject. After presentation there will be ample time for questions and comments from the workshop participants. I hope the papers to be presented will provide the ground for interesting and stimulating discussion.

b) Study some ways of introducing a speaker at a workshop:

- I am very happy to introduce our first speaker this morning. Professor Osamu Kitani is President of the Japanese Society of Agricultural Machinery, member of the Science Council of Japan and Member of numerous advisory councils for science and technology in different countries. He obtained his B.Agr., M.Agr. and Dr.Agr. at the University of Tokyo and his Ph.D. at Michigan State University. In his academic career he was author or co-author of some 20 books, author of over 90 original papers and 30 articles. Professor Kitani will speak to us today on the problem of soil dynamics.
- It is a great pleasure for me to introduce Professor Bill Stout who joined the Agricultural Engineering Department at Texas University in 1981. Dr. Stout was born on a wheat and cattle farm in Nebraska in 1932. He has over 40 years of experience in agricultural engineering and has been deeply involved in international applications. He has authored or edited eight books on mechanization and energy management in agriculture and has also published 140 papers in technical journals. Professor Stout's subject today is "Ethics and Agricultural Research".

Task 11

Find in the text the paragraphs describing the power and performance features and the engine cooling systems and translate them into Russian in writing.

Task 12

Find the key words to speak about Cummins turbo diesel engines.

Task 13

Write an annotation of the text in English.

Task 14

Look through Text 4 and say

a) why the word "Caterpillar" is so often mentioned in it;
b) what machine is described in the text;
c) why this text is included in Lesson 11.

Text 4

The new Caterpillar G-series wheel tractor scrapers 621G, 623G, 627G, 631G, 637G and 657G have been improved to boost productivity and lower operating costs. The 627G, 637G and 657G tandem-powered machines have new electronically controlled scraper engines that incorporate dual power capabilities, just as the tractor engines do. Each of the new scrapers has a new productivity enhancing operator station, a redesigned scraper bowl with 10 percent more capacity, and the latest electronic monitoring system to simplify maintenance.

All G-series wheel tractor scrapers incorporate Cat's EU Stage IIIa compliant ACERT Technology engines. The electronically controlled engines feature the Caterpillar HEUI fuel system and comply with current emissions regulations. Each engine is

transmission to provide maximum power to the cutting edge and high-production haul road speed. The engines ranging from C9 to C15 and C18 provide advanced electronic control, precise fuel delivery and refined air management for outstanding engine performance. ACERT Technology builds on decades of Caterpillar experience in diesel engine design and manufacturing. It takes advantage of a number of "building block" engine technologies. Some are recent innovations, while others have already proven themselves over millions of hours of use on the job. ACERT building blocks include:

- Fuel delivery – The multiple-injection process introduces fuel into the combustion chamber in a number of precisely controlled "microbursts". Injecting fuel in this way allows for precise shaping of the combustion cycle. For optimum performance, the multiple-injection process can be tailored for different applications and engine sizes.
- Air management – Advanced air management also plays a critical role in reducing emissions. Stage IIIa off-road engines include crossflow heads and wastegated turbochargers. Advantages of wastegated turbos include higher boost levels over the entire operating range resulting in better low-end performance and response. Crossflow heads improve breathing for optimized combustion.
- Electronics – The "brain power" for ACERT Technology comes from Cat ADEM 4 electronic controllers. The Cat ADEM 4 can govern fuel delivery and other engine processes with incredible precision. Cat ADEM 4 provides the ability to link machine performance directly with the engine.

The 621G, the 623G and 627G scrapers all use the Cat C15 as the tractor engine. The dual horsepower engine produces net power 246 kW in lower gears and 272 kW in higher gears. Heaped bowl capacity is 17 m3 for 621G and 627G and 17.5 m3 for 623G.

c) Pay attention to the phrases which can also be used in an Opening Address:

- Mr. Vice-President, Honored Guests, Ladies and Gentlemen! It gives me great pleasure to welcome you to…,
- Let me also offer our most sincere welcome to our colleagues from….

I wish to add my special words of welcome to our foreign participants.

- Five years have passed since our last meeting in … (since the last conference was held in …)

Much progress has been made in field of….

- The conference will cover a wide range of subjects….

This conference will focus on some theoretical and practical aspects of ….

The primary purpose of our meeting is ….

- The number of active participants in this conference is…. Leading specialists from several countries have accepted our invitations to present their research findings.
- Along with plenary sessions there will be section meetings (workshops). Each participant will be allowed 15 minutes for the formal presentation of the paper.
- Minutes will be taken….
- The items on the agenda are ….
- We hope that this conference will promote new contacts and strengthen cooperation among scientists from different countries (parts of the world). We are confident that you will have a scientifically enjoyable experience.

Task 2

a) Read Text 2 and make an outline of it. Compare your outline with the one presented in Task 1 a. What is the difference?

cial welcome to the people from foreign countries who visit us today.

The past three years have been highly intensive years rife with important events. CIGR has become an organization that unites all national, regional and sub-regional associations that create a system truly capable of promoting a growing role for engineering and associated disciplines in the development of the agro-industrial system in the various countries and regions. In the past few years there has been great progress in different fields of the agro-industrial system, especially in the field of soil cultivation. But much further research has also to be done.

At the present congress both new methods and new technologies of soil cultivation will be emphasized with a wide range of theoretical and experimental problems. The primary purpose of this meeting is to give the participants an opportunity to report their latest findings and to exchange their ideas.

We are pleased that so many people have come to attend this congress. With 1,730 registered participants from 90 countries from all over the world, with 144 Technical Sessions in which 900 poster and oral presentations will be held, and with facilities allowing 20 presentations to be held in parallel sessions, this is the biggest Congress of CIGR so far.

We expect that the present Congress will contribute to further development of the most important problems and enable the various countries to quickly achieve rational and comprehensive solutions in this field. We also hope that the congress will provide opportunities for personal exchange of scientific results and strengthening of personal friendships among scientists from different parts of the world. And now I declare the conference open and wish all of you every success.

b) Read the text once again and write out the phrases which are used by the Chairperson bearing in mind the outline given in Task 1a.

Task 15

Read the text using the Vocabulary and a dictionary to answer these questions:

1. What do electronically controlled engines feature?
2. What do ACERT building blocks include?
3. What is the net power produced by the dual horsepower engine?

Task 16

Find in the text the paragraphs describing ACERT building blocks and translate them into Russian in writing.

Task 17

Write an annotation of the text in English. Title the text.

LESSON 12

ROLE PLAY

Now when you've got a lot of information on diesel engines you are to take your examination. The teacher gives each of you a question on the structural features of diesel engines, their advantages and possible applications. You have some time (15-20 minutes) to prepare your answers. Mind that some of you are good students and some are not quite good (they can be mistaken). The teacher is to comment on your answers. Think and dramatize the situation according to your roles: the teacher, the students having different levels of knowledge. You're welcome.

ENGLISH-RUSSIAN VOCABULARY

OF SPECIAL TERMS

A

absorb	абсорбировать, поглощать, впитывать, амортизировать
accumulate	аккумулировать, накапливать
acid	кислота
action	воздействие, действие
actuate	приводить в движение или действие
actuator	привод (силовой), механизм для передвижения, исполнительный механизм
add	прибавлять, присоединять
additional	вспомогательный, дополнительный
adhere	прилипать, слипаться, сцепляться
adhesion (of wheels)	сцепление (колес с грунтом)
adjust	налаживать, регулировать
adjustable	регулируемый
admission	впуск, допуск, поступление (воздуха), наполнение (цилиндра)
admit	допускать, впускать
amount	количество, величина, степень
angle	угол
angle of action	угол действия
angle of attack	угол атаки
antifreeze	антифриз
application	применение, приложение (силы, усилия), приведение в действие, включение
apply	применять, употреблять, прилагать (силу)
area	площадь, поверхность, пространство, участок, зона

UNIT 2
THE CHAIRPERSON

When preparing for a conference you may be invited to chair a plenary session or a section (working group) meeting. The chairperson at a conference has several functions:

a) Opening a session and giving an introductory speech.
b) Chairing a session.
c) Summing up the discussion and closing the session.

Task 1

a) Read Text 1 and find the paragraphs in which the chairperson

introduces the main theme and the goal of the conference;

welcomes the participants;

expresses your expectations from the conference and extends best wishes to the participants;

gives special welcome to high ranking personalities and distinguished quests;

gives information about the participants, structure and organization of the conference;

makes reference to the previous conference and to the progress made in this field of science since then.

Text 1

OPENING ADDRESS

Mr. President, Distinguished Guests, Dear Colleagues!

It is my honor and my great pleasure to welcome you here to the Fifteenth World Congress of CIGR (International Commission of Agricultural Engineering).

Let me now express my warmest greetings to the new officers of CIGR. To all members of the current Board, particularly to the President of CIGR, Professor Axel Munack and Secretary General prof. Peter Schulze Lammers. I would like to extend spe-

a) Pay attention to the phrases which can be used when asking a question:

- Mr. Chairperson, may I ask a question to the speaker?
- I would like to ask … a question.
- I have a question for/to….
- I have … one/two/several/question/s.
- I would like to ask a simply/difficult/brief question.
- I have another/one more question.
- Let me put my question in a different way.
- I have no questions, and I would like to thank the speaker for the most interesting presentation.
- Could you please repeat…?

b) Pay attention to the phrases which can be used when answering a question:

- This is a good/interesting/question. Thank you for asking it.
- It's a difficult/intricate question. I can't give a detailed answer to it now.
- You have raised an extremely important point.
- May I begin by answering the last question?
- I haven't quite understood your question. Please repeat you question.
- I think nobody can answer you question.
- Would you mind if I come back to your question later?
- I'm not sure this question should be answered. It's not quite relevant to the subject discussed.
- I'm afraid you misunderstood me. I didn't mean to say that ….

Task 6

Practice delivering your paper and answering the questions asked by your groupmates. Take into account the tips given.

arrangement	приспособление, размещение, расположение, устройство, установка, монтаж
assemble	монтировать, собирать
assembly	агрегат, комплект, узел
atomize	распылять
atomizer	распылитель, форсунка
attach	крепить, прикреплять, присоединять
attachment	(при)крепление, приспособление, соединение, принадлежность
auger	сверло, шнек
automobile	автомобиль
auxiliaries	вспомогательное оборудование, добавка, присадка
auxiliary	вспомогательное устройство; вспомогательный
availability	(при)годность, наличие, доступность
available	доступный, имеющийся в распоряжении, пригодный, отвечающий требованиям
axle	ведущий мост, ось, полуось
front (fore) axle	передний мост, передняя ось
rear axle	задний мост, задняя ось
B	
bar	балка, стержень, штанга, болванка, брусок
draw bar	сцепной прибор, сцепное устройство (приспособление), стяжка, затяжной болт, тяговый брус, тяга
cutter bar	режущая полоса уборочной машины
barrel	втулка, цилиндр, барабан, бочка,

battery	аккумулятор, (аккумуляторная) батарея
beam	балансир, балка, коромысло
bear	нести нагрузку, опираться, подпирать
bearing	опора, опорная поверхность, подшипник, опорный
adjustable bearing	регулируемый подшипник
main bearing	коренной подшипник
non-adjustable bearing	нерегулируемый подшипник
bed	основание, стенд, установка, ложа, станина; приработаться
bedplate	фундаментальная плита, подушка (опорная плита), станина
belt	лента, ремень (приводной)
driving belt	приводной ремень
timing belt	ремень привода газораспределительного механизма
belt-driven	с ременным приводом
V-belt-driven	с клиновым (V-образным) ременным приводом
block	блок, колодка, препятствие, блокировка, узел
air block	воздушная пробка
cylinder block	блок цилиндров
blow	обдувка, продувка; обдувать, продувать
blower	вентилятор, нагнетатель, компрессор
centrifugal blower	центробежный вентилятор, нагнетатель
body	корпус, остов, кузов (автомобиля)
grain body	кузов для перевозки зерна

b) Try to remember some other phrases which can be used in the main body of a paper:

- At this point I'll speak in more detail about….
- Let us turn (back) to….
- I would like to say a few words on….
- From this it follows that….
- On the one hand…, on the other hand….
- In other words….
- In particular….
- It is essential (important), interesting that….
- It is to be noted that….
- It is important to recognize that….
- Of special interest/importance is the fact that….

c) Read the main body of the paper once again and write the main body of your own paper concerned either with your research or one of the subjects given in the list above (Task 2 c).

Task 4

a) Read the final part of the paper (Text 1, paragraph 8) and write out the phrases which are used to conclude the paper.

b) Try to remember some other phrases which can also be used in the final part of a paper:

- From this it can be concluded that….
- Summarizing / To summarize what I have said….
- In conclusion, we will say that….
- To conclude my talk, I'd like to say that….

c) Write a conclusion to your own paper.

Task 5

When the presentation of the paper is over the speaker usually takes questions.

- I'll start by considering some aspects of…. Then I'll concern myself with the methods used. In conclusion, I'll make an attempt to….

- I'll divide my talk into three parts. First, I'll consider some problems of….

- Then I'll concentrate on….

- To conclude, I'll make some comments on….

c) Read the introduction to the paper once again and write an introduction to a paper concerned either with your own research or with one of the subjects given in the list below:

- The Advantages of Diesel Engines;
- Why Use Diesel Engines;
- Case IH;
- Case Magnum Tractors;
- New Holland Big Balers;
- New Holland TX Combines;
- Massey – Ferguson 3000;
- John Deere Harvesting Attachments;
- HRB Power Harrows;
- AVR – 220B 2-row Potato Bunker Harvester;
- Tiger ST-450;
- The Deutz DX230;
- Ford's Biggest;
- Volvo BMT-700;
- Perkins Tractor Diesel Engines.

Task 3

a) Read the main body of the paper (Text 1, paragraphs 4-7) and write out the phrases which make the composition of the text distinct; specify and clear up the points being discussed and draw the attention of the audience to the most important points.

bolt	болт, палец, стержень, шпилька, задвижка; стягивать (соединять) болтами
boost	наддув, усиление
bowl	корпус, кубок, чаша, резервуар
sediment bowl	отстойник
brake	тормозной механизм, тормоз; тормозить, притормаживать
braking	торможение; тормозной
breather	сапун, вентиль
built-up	сборный, составной, разъемный, наплавленный
burn	гореть, сжигать
burst	взрыв, разрыв, вспышка; разрываться, взрываться, вспыхивать
button	кнопка
bypass	обводной (перепускной) канал (клапан); обходной; боковой
by-product	побочный продукт
C	
cab	кабина
tractor cab	кабина трактора
truck cab	кабина грузового автомобиля
cam	кулачок, эксцентрик, зуб, выступ
actuating cam	кулачок привода
camshaft	распределительный (кулачковый) вал
cap	головка, колпак, крышка, перекладина
pressure cap	крышка герметизированной системы
pressure radiator cap	крышка герметизированной системы радиатора

capacity	вместимость, емкость, мощность, производительность, (пропускная) способность, рабочий объем (двигателя)
car	(легковой) автомобиль, тележка, вагон
carburetor	карбюратор
carry	везти, возить, носить, переносить(ся)
cartridge	патрон, заряд, гильза, втулка
filter cartridge	фильтрующий элемент
center	центр
center of gravity	центр тяжести
bottom	нижняя мертвая точка (НМТ)
dead center	
lower dead center	нижняя мертвая точка (НМТ)
top dead center	верхняя мертвая точка (ВМТ)
upper dead center	верхняя мертвая точка (ВМТ)
chamber	камера, полость; помещаться
combustion	
chamber	камера сгорания
main combustion	
chamber	основная камера сгорания
change	изменение, смена; изменять, сменять
speed change	переключение передач, изменение скорости движения
characteristic	характеристика
operating	
characteristic	эксплуатационная характеристика
charge	заряд(ка), стоимость (цена); заряжать, нагружать, заправлять
additional charge	дополнительный заряд, подзарядка
fresh charge	заряд свежей рабочей смеси

sure that works on the mechanical state of implements and on the degree of wear of working tools and their influence on the quality of work have to be encouraged.

In conclusion, I will recognize that the subject as for new methods and new technologies are concerned is one quite complicated to be solved and recommend that every effort be made to improve integrated multidisciplinary exchanges, to define the optimal technologies and processes for each specific climatic and pedological condition with a view to reducing costs, thereby enhancing the economic competitiveness of farmers on the international marketplace; underline the need to reduce soil compaction, to improve manufacturing method, to develop information and decision support systems as a key factor for improving new techniques.

Thank you very much for attention.

Task 2

a) Read the introduction to the paper (paragraphs 1-3) and write out the phrases which express the speaker's appreciation for being able to present his/her paper; the statement of the problem (subject) and its importance; the outline of the sections of the paper.

b) Try to remember some other phrases which can be used in introduction to a paper:

- It is a great pleasure for me to take part in this meeting and to have an opportunity to give a talk here.
- I'd like to begin by expressing my appreciation for this opportunity to exchange information and ideas on the problems which interest all of us.
- In my paper I will concern myself with….
- My talk deals with/is concerned with….
- The aim/purpose of my talk today is to consider/discuss….
- My task today is to speak/report about….

efficient in erosion control and building soil structure stability; their effects are more or less relevant in different conditions. The trend on a world basis indicate a certain spread of minimum tillage and no-till practices even if future developments are still uncertain. For some extensive crops this shall depend mainly on the evolution of herbicide technique, while keeping the environmental chemical pollution on an acceptable level. It should be stressed that public administrators can intervene indirectly aiming at a general economic and social welfare as well as an environmental protection in the frame of sustainable agriculture.

Let me now make some comments on future cultivation methods and the associated technologies that will be characterized by: improved adaptation to climatic conditions; reduced mechanical weed control due to advances in chemicals and genetic engineering; improved energy efficiency of processes and vehicles, with lower tractor wheel slip in the case of drawn implements, and reduced acceleration of soil particles in the case of mounted PTO driven tools; techniques utilizing the straw left on the soil from the previous crop.

At this point I'll speak in more detail about solutions which permit lower costs while at the same time maintaining yields. In any case, they help avoiding inversion of the soil where it is subject to erosion by wind and water, and this can be achieved using disc-harrow based systems for preparing seedbeds suitable for spraying with cheap herbicides utilizing appropriate seeders.

Now I'll pass over to summarizing the actions of soil tillage implements and their performances in relation with adjustments, the mechanical states and the conditions of their use. Considering the big diversity of implements, there is the need for unification of terminology also in order to help the reproductivity and transposability of research results. The main factors to consider are: type of tool, hitch type, type of action (passive, active), operative mode, soil engaging components, angle of installation of engaging components and their arrangements, etc. I am perfectly

check	проверка, контроль, испытание, стопор; проверять
checking	проверка, контроль
circulate	двигаться по кругу; циркулировать, иметь круговое движение
circulation	циркуляция
cooling liquid circulation	циркуляция охлаждающей жидкости
oil circulation	циркуляция масла
classification	классификация
cleaner	фильтр
air cleaner	воздухоочиститель, воздушный фильтр
centrifugal air cleaner	центробежный воздушный фильтр
centrifugal oil cleaner	центробежный масляный фильтр
cleaning	очистка, промывка
clog	препятствие, засорение; засорять(ся), закупоривать(ся), забивать(ся)
clogging	засорение, загрязнение, закупорка
clutch	сцепление, муфта; включать сцепление
coat	(поверхностное) покрытие, слой покрытия, нанесение покрытия
coating	покрытие, слой
coil	виток, змеевик, катушка, обмотка
spark coil	катушка зажигания, бобина
common rail	система впрыска топлива дизельного двигателя, в которой в каждую форсунку топливо подается из общего аккумулятора (*в аккумулятор топливо непрерывно подкачивается*

compensate	компенсировать, выравнивать
complete	набор, комплект; полный, законченный; комплектовать, заканчивать, завершать
completion	завершение, окончание, заключение, комплект
compress	сжимать
compression	сжатие, сдавливание, компрессия, ход сжатия
computer	компьютер
on-board computer	бортовой компьютер
condition	состояние, условие, положение
adverse conditions	неблагоприятные условия
environmental conditions	условия окружающей среды, внешние условия
field conditions	полевые условия, условия эксплуатации
operating (running, service) conditions	условия эксплуатации, рабочие условия
connect	связывать, соединять
connection	включение, связь, (под)соединение, штуцер, патрубок
consume	потреблять, расходовать
consumption	расход, потребление
fuel consumption	расход топлива
oil consumption	расход масла
contaminant	загрязнение, загрязняющее вещество, примесь
contaminate	загрязнять
continuous	непрерывный, постоянный
control	контроль, регулирование, регулировка, управление;

UNIT 1
THE SPEAKER

Task 1

Read Text 1 "A Paper at a Scientific Conference" and pay special attention to its structure. Mind that each paper should have an introduction, main body and conclusion.

Text 1

A PAPER AT A SCIENTIFIC CONFERENCE

Mr. Chairperson, Dear Colleagues, Ladies and Gentlemen!

I think it is a privilege for me to participate in this conference and to have an opportunity to give a talk here. I greatly appreciate this privilege.

In my talk today I am going to deal with some new methods and technologies of soil cultivation. It is one of the most important rural problems which concern the integration of nature and environmental problems in the new farming methods. This very urgent topic has been discussed by different specialists representing the research sector and the viewpoint of agricultural machinery manufacturers. And I believe that my information might be both of theoretical and practical interest.

In this talk I will consider tillage and management systems which are very efficient in erosion control and building soil structure stability, future cultivation methods and the associated technologies, solutions which permit lower costs while at the same time maintaining yields, the actions of soil tillage implements and their performance. And finally I'll make some conclusions and recommendations.

To begin with, I'd like to say that tillage and management systems have been developed based on the many complex actions of tillage operations and their interactions with other agronomic factors. It should be noticed that some of these systems are very

PART II
SCIENTIFIC ENGLISH

You are a student of the Bashkir State Agrarian University. There are many nice traditions at this University. One of them is the tradition of holding Students' Scientific Conferences with presentations in a foreign language.

If you are a junior student, you can present a paper on country science. If you are a senior student, your paper can be concerned with your research work.

The objective of such conferences is to report and consider your first developments and achievements in the field of your research, to exchange information and ideas on the subject, to obtain better understanding of the problems and to discuss the questions that can arise during the work of the conference.

Such conferences also provide an opportunity for communicating in a foreign language in order to improve and extend its knowledge, to make it more profound.

On graduating from the University some of you will be granted a research at different chairs and allowed to take part in scientific conferences for young researchers and specialists with presentations in a foreign language held in the Bashkir State Agrarian University, too.

Things do happen and perhaps one day you will be extended an invitation to present a paper on your subject at an International Conference.

The purpose of this Part is to provide the necessary information that will make it possible for you to participate in many interesting scientific gatherings.

The information is discussed under the following headings:

1. **The Speaker**
2. **The Chairperson**
3. **Discussion**

combustion control	регулирование процесса сгорания, управление процессом сгорания
fuel intake control	управление подачей топлива
gear controls	механизм переключения передач
remote control	дистанционное управление
convex	выпуклый
cool	прохладный; охлаждать
coolant	охлаждающая жидкость, охладитель, хладагент
cooler	охладитель, радиатор, холодильник
air cooler	воздухоочиститель
engine cooler	радиатор системы охлаждения двигателя
cooling	охлаждение
air cooling	воздушное охлаждение
fluid (liquid) cooling	жидкостное охлаждение
water cooling	водяное охлаждение
corrosion	коррозия
cost	стоимость, **-s** затраты, расходы
operating cost(s)	стоимость эксплуатации
repair cost(s)	ремонтные расходы
crack	трещина; трескаться, расщепляться, лопаться
cracking	растрескивание, образование трещин
crank	колено, кривошип, коленчатый (кривошипный) рычаг
crankcase	картер двигателя
crankshaft	коленчатый вал
cycle	период, цикл, такт, круговой процесс
Diesel cycle	цикл Дизеля, цикл с воспламенением

four-stroke cycle	четырехтактный цикл
Otto cycle	цикл Отто, цикл с воспламенением от искрового разряда, двигатель, работающий по циклу Отто
two-stroke cycle	двухтактный цикл
cylinder	цилиндр

D

damage	повреждение, дефект, порча, ущерб; повреждать
decompress	снижать давление
deicer	антиобледенитель, дефростер, стеклообогреватель
delivery	подача, доставка, поставка
density	интенсивность, плотность, густота, удельный вес
design	конструирование, проектирование, конструкция, проект, чертеж; конструировать, проектировать; предназначать
deteriorate	изнашиваться, разрушать(ся), ухудшать(ся), срабатывать(ся)
deterioration	изнашивание, износ, повреждение
device	механизм, прибор, устройство, приспособление
diesel	дизель, дизельный двигатель; дизельный
four-stroke diesel	четырехтактный дизель
turbocharged diesel	дизель с турбонаддувом
diesel-powered	с приводом от дизельного двигателя
dip	откос, уклон, провес; погружение; погружать

Дон».

Поставщиками комбайнов Кейс и Нью Холланд является фирма «НХ-CNH», комбайнов и тракторов Джон Дир – фирма «Джон Дир» (США), комбайнов Доминатор 208 Мега – фирма «Клаас» (Германия).

Приобретением и реализацией почвообрабатывающей, посевной техники и техники для защиты растений и внесения удобрений фирмы «Амазоне» (Германия) в республике занимается КФХ «Артемида» (Кармаскалинский район), ООО «Галс» (Аургазинский район) – для возделывания и уборки сахарной свеклы.

Техническое обслуживание и ремонт импортной техники в период гарантийного срока выполняются фирмами-поставщиками. По истечении срока гарантии завода-изготовителя обслуживание этой техники и поставка запасных частей, по договорам с ее пользователями, производятся фирмой «НХ-CNX».

Основной парк зерноуборочной и кормозаготовительной техники находятся в ГУСП «МТС Башкирская».

(По данным министерства сельского хозяйства Республики Башкортостан на 01 ноября 2005 г.)

down the two variants.

Task 153

Make a precis on the subject "Farm Machinery" (Texts 1-26). Do it both in English and in Russian. Write down the two variants.

Task 154

Render the information in English. Comment on it.

Башкортостан является одним из ведущих сельскохозяйственных регионов Российской Федерации. Отмечая высокий уровень развития всех основных отраслей сельского хозяйства в республике, следует сказать, что башкиры традиционно и очень успешно занимаются животноводством, коневодством и пчеловодством. Башкирское мясо и знаменитый башкирский мед известны во всем мире.

Особое внимание аграрии уделяют растениеводству. Крестьяне выращивают различные зерновые и овощные культуры, широко используя современную отечественную и зарубежную технику, которая в настоящее время все чаще и чаще появляются на полях республики. Это объясняется двумя факторами: во первых, зарубежные машины весьма надежны, так как изготавливаются из самых качественных материалов, что гарантирует их более высокую наработку на отказ – до 100 моточасов (в то время как у отечественных машин она составляет 8-10 моточасов); во вторых, условия работы оператора в высшей степени комфортабельны, он имеет в своем распоряжении улучшенные органы управления (бортовые компьютеры).

В настоящее время в республике задействованы 40 зерноуборочных комбайнов Кейс 2366, 98-Кейс 525/527, 480-Нью Холланд различных марок, 55-Джон Дир 9550/9560, 25-Доминатор 208 Мега, 14 тракторов Джон Дир. Кроме того,

direct	прямой, непосредственный; направлять, управлять
direction	направление
dirt	грязь, загрязнение
discard	брак, бракованная часть; браковать
discharge	выгрузка, разгрузка, выпуск, разряд, расход (масла), подача (насоса), слив; производительность; опоражнивать, выпускать, выгружать; разгружать, вытекать, выпускать, разряжать.
dissipate	рассеивать(ся), распылять(ся), распространять(ся)
dissipation	потеря, рассеяние, утечка
dissolve	растворять(ся), разжижать(ся)
distort	деформировать(ся), коробиться, перекашивать(ся)
distortion	деформация, искажение, коробление, перекашивание
distribute	классифицировать, распределять
distribution	классификация, распределение
fuel distribution	распределение топлива
load distribution	распределение нагрузки
power distribution	распределение мощности
torque distribution	распределение крутящего момента
distributor	распределитель
fuel distributor	дозатор топлива
ignition distributor	распределитель системы зажигания
door	дверь, дверца, заслонка
access door	горловина для ухода, ремонта
drain	дренаж, слив, сток, осушка; сливной; осушать, спускать
draw	тяга; всасывать, тянуть; чертить

drive	привод, передача движения; ведущий; приводить в действие (движение), везти, двигать, управлять (автомобилем, трактором и т.п.)
belt drive	ременная передача, ременный привод
final drive	главная передача
front (-wheel) drive	передача на передние ведущие колеса, передний привод
rear (-wheel) drive	передача на задние ведущие колеса, задний привод
driven	ведомый, приводимый в действие (движении)
driver	водитель, шофер; ведущая деталь; движитель
tractor-driver	тракторист
drum	барабан, цилиндр
duct	канал, проход; трубопровод
dump	отвал, опрокидыватель; опрокидывать, сваливать
durability	долговечность, срок службы, износостойкость
durable	долговечный, износостойкий, обладающий большим сроком службы
duration	длительность, продолжительность
dust	пыль; запылять; очищать от пыли

E

ease	легкость; удобство; облегчать, ослаблять
servicing ease (ease of service)	удобство (технического) обслуживания
effect	влияние, эффект, (полезное)

same high quality silage. Due to the high pressure exerted by the wheels on the ground, both processes require fields with very high load bearing capabilities.

Jumbo self-loading silage wagons with volumes of up to 48 m^3 achieve very high transport capacities. The actual costs for each process depend on the actual farm operating conditions. The self-loading wagon process has cost advantages over the forage harvester where the area to be harvested annually is smaller to medium-sized, transport distances are shorter and yields lower. The number of machines, operators and the investment costs are lower with a self-loading wagon than with a forage harvester. Arguments in favour of a self-propelled forage harvester are a large area to be harvested annually, a high transport requirement and/or whether the farm in question grows maize.

The decision for one of the two processes therefore requires that the actual farm operating conditions are taken into consideration.

Task 150

Read Text 26D to answer the question:

What are, in the author's opinion, the advantages of self-loading wagons and what are the arguments in favour of self-propelled harvesters?

You may use a dictionary.

Task 151

Make a precis on the subject "Clever Farming" (Texts 26). Do it both in English and in Russian. Write down the two variants.

Comment on the information of Texts 26.

Task 152

Make a precis on the subject "Harvesting Machinery" (Texts 16-26). Do it both in English and in Russian. Write

chine.

A high-density bale is achieved by the fixed chamber combined system.

Task 147

Read Text 26C and describe the machines mentioned in the text in Russian. You may use a dictionary.

Task 148

Write a summary of Text 26C in English.

Task 149

Read the title of Text 26D and say what it is about.

Text26D

CLEVER FARMING: FORAGE HARVESTER OR SELF-LOADING WAGON?

Self-loading wagons and self-propelled forage harvesters with high capacities are suitable for preparing silage at large farms. Both processes have been assessed during field tests in actual farming conditions. With regard to their technical suitability, the distribution of chopped lengths with self-loading wagons and forage harvesters is comparable and both processes produce the

efficiency	мощность, отдача, производительность, эффективность, коэффициент полезного действия (кпд)
operating (working) efficiency	эффективность эксплуатации
volume (tric) efficiency	объемный кпд (двигателя), коэффициент наполнения
element	деталь, секция, часть, элемент
filter element	фильтрующий элемент
emission	выделение; отдача
exhaust emission	выделение продуктов сгорания с отработавшими газами
end	днище; торец, конец, край; головка, наконечник
front end	передняя часть
rear(tail) end	задняя часть
engage	вводить в зацепление, зацеплять, включать; сцеплять, соединять
engagement	зацепление, сцепление; сцепка
engine	двигатель, мотор
air-cooled engine	двигатель с воздушным охлаждением
compression ignition engine	двигатель с воспламенением от сжатия
diesel engine	дизельный двигатель, дизель
eight-cylinder engine	восьмицилиндровый двигатель
fuel-injection engine	двигатель с впрыском топлива; дизель
gasoline engine	бензиновый (карбюраторный) двигатель
heavy-duty engine	двигатель для работы в тяжелых условиях (с высоким кпд), форсированный двигатель

high-power(ed) engine	форсированный двигатель
internal-combustion engine	двигатель внутреннего сгорания
liquid-cooled engine	двигатель с жидкостным охлаждением
petrol engine	бензиновый двигатель
steam engine	паровой двигатель
engineer	инженер, механик
mechanical engineer	инженер-механик
engineering	конструирование; техника
enter	входить, проникать, вступать; поступать
entry	вход, въезд
equip	оборудовать, оснащать, снабжать, снаряжать
equipment	аппаратура, оборудование; оснащение, снаряжение
auxiliary equipment	вспомогательное оборудование
escape	выпуск; течь, утечка; давать утечку, вытекать
evaporate	испарять(ся)
evaporation	испарение
excess	избыток, излишек
excessive	избыточный, чрезмерный
exhaust	выпуск, выхлоп; отработавшие газы; выпускной; выпускать
expand	расширять(ся), увеличивать(ся) в объеме
expansion	расширение; пространство

The chopping system is equipped with the proven individual knife protection system. 39 knives cut to a chopped length of 35 mm, ensuring ruminators are kept happy. The knife bank pivoting system – a unique Pöttinger innovation – is provided as standard.

The latest generation of self-loading wagon operating system – the ISOBUS job computer with Power Control unit – provides industry – leading comfort. All functions can be controlled from the tractor seat.

Rollprofi 3300 proficut – the cutting–edge round baler with optimum ground hugging which is ensured by the 2.2 metre – wide pickup suspended by a central arm. The pickup is given additional stability by the cam control tracks at each end. The feed rotor has 4 rows of V-shaped tines for smooth chopping without power peaks.

The heart of the baler is the proficut chopping system featuring 25 knives, an innovation in baler technology. The knives can be released hydraulically from the control panel, and the whole knife bank can be pivoted out from underneath the ma-

crop dries more evenly. Because the mower can be operated from the downhill side it follows the tractor more accurately on slopes. Eurotop 421A – a new rake for smaller-sized operations – has been added to the windrower range. The single rotor Eurotop 421A with a working width of 4.2 metres is now available as a trailed version.

This windrower is equipped with 12 tine arms with 4 dual tines each. The unit is raised hydraulically for transport. Hydraulic cylinders on the chassis and drawbar provide the necessary ground clearance.

Floating tandam axles are supplied as standard. Fitted with the add-on Multistat wheel this rake offers unbeatable ground hugging.

Torro 4500/5100 – a grand name for the new range of superior – class silage trailers available with loading volumes of 45 or 51 m. This new self-loader can be used with tractors from 100 kW/136 horsepower upwards.

Best possible ground hugging is provided by the suspended pickup which is controlled from both ends. Even large swaths are picked up reliably with the 1.85 m wide pickup.

The high performance Powermatic loading rotor has a diameter of 800 mm and 8 rows of tines arranged in a helix. The rotor is driven by a sealed wet transmission system.

explosion взрыв, вспышка
explosive взрывчатое вещество; взрывчатый
expose выставлять (напоказ); оставлять незащищенным (от погоды); подвергать
exposed незащищенный, открытый
extend вытягивать(ся), удлинять(ся); расширять(ся); распространять(ся)

F
fail выходить из строя; глохнуть; отказывать (в работе)
failing выход из строя; отказ; остановка
failure авария; выход из строя; неисправность; отказ; перебой; повреждение, поломка, разрушение
fan вентилятор
centrifugal fan центробежный вентилятор
radiator fan вентилятор радиатора
fan-cooled охлаждаемый вентилятором
feature особенность конструкции; характерное свойство, конструктивная особенность; быть характерной чертой (особенностью, свойством)
feed питание; подача; нагнетать, питать, подавать
continuous feed непрерывная подача
forced (pressure) feed подача под давлением
fuel feed подача топлива
filter фильтр; фильтровать
air filter воздухоочиститель, воздушный фильтр
coarse (primary) filter фильтр грубой очистки

fuel filter	топливный фильтр
oil filter	масляный фильтр
fin	заусенец; ребро (для воздушного охлаждения)
radiator fin	пластина радиатора
fit	посадка; пригонка; монтировать; устанавливать; оснащать; пригонять
fitting	монтаж; подгонка, пригонка; сборка; патрубок; ниппель
fleet	парк (автомобилей, тракторов); автомобильное (тракторное)
flow	струя, поток; расход; течение; циркуляция (в замкнутой системе (контуре)); течь
fluid	жидкость; жидкий, текучий
flywheel	маховик
engine flywheel	маховик двигателя
force	сила, усилие; нагнетать; форсировать
forced	вынужденный, принудительный; усиленный, форсированный
frame	каркас, корпус; остов, рама
engine frame	подрамник (рама) двигателя
rigid frame	жесткая рама
freeze	замерзать, замораживать; застывать
friction	трение
front	передняя (лицевая) часть (сторона); головной, лобовой, передний
fuel	топливо, горючее; снабжать (питать) топливом; заправляться горючим
high-grade fuel	высокосортное (высококачественное) топливо
liquid fuel	жидкое топливо
low-grade fuel	низкосортное (низкокачественное)

Best possible cutting quality is the most important objective. The new generation of disc mowers from Pöttinger delivers perfect cutting quality with their optimized counter-cut zone. There is also hardly any gap between the upper edge of the cutter bar and the counter – cut zone. This means that even heavy, flattened grass can be cut to the highest quality. The crop really flows through the mower over the smooth profiled discs. Tractor power requirement is lower as a result; dynamic crop flow means the mower is operating at peak efficiency all the time.

The main problem in practice is the high level of contamination of the forage. These contaminants bring in a large number of organisms that can cause a great deal of trouble, from fermentation (e.g. butyric acid) through to forage quality and milk quality (e.g. clostridium). The new cutter bar features an important detail in this respect. The slanted leading edge of the cutter bar allows the earth to flow beneath, separating it from the crop.

Task 144

Find in Text 26B the paragraph describing the most important objective of disc mowers and translate it into Russian in writing.

Task 145

Write a summary of Text 26B in English.

Task 146

Look through Text 26C (News for the Nearest Future…) and say what machines are described in it.

Text 26C

NEWS FOR THE NEAREST FUTURE …

Catnova 3100T – the new trailed mower with center-mounted drawbar which can be pivoted hydraulically to either side. This allows a field to be mowed from one end so that the

take over some of the driver's more repetitive tasks. The advantages for the farmer are: clear overview when operating all machines, supervision of performance parameters, automation of working steps and efficient data collation and processing.

Task 142

Read Text 26A to answer the questions put to Heinz and Klaus Pöttinger by the interviewer. Do it in Russian. By the way, what do Heinz and Klaus Pöttinger do for a living? While reading the text you may use a dictionary.

Task 143

Read the title of Text 26B and say what machine is described in it.

Text 26B

NEW GENERATION OF DISC MOWERS

The critical factors for obtaining high forage quality include planning each harvest step in line with the plant physiology, using technology that preserves the quality of the crop, and ensuring that the harvest machinery is set up properly. The parts of the plant nearest to the ground must be protected if tillering is to be intensified. The reserve zone that promotes growth, and thus sideways sprouting or "tillering", is located down near the soil. You need to protect the sward if you do not want to limit tillering activity.

residual (return) fuel	остаточное (невыработанное) топливо
furrow	борозда; выемка, желоб, канавка; бороздить; пахать
G	
gage (gauge)	датчик; измерительный прибор; манометр
gallery	площадка; продольный канал (смазочный)
gallon	галлон (амер.=3,785 л; англ.=4,545 л)
gang	комплект (набор) инструментов; батарея; ряд
disc gang	дисковая батарея, дисковая секция
gap	зазор; интервал; (искровой) промежуток; просвет; щель
gapping	неплотное прилегание; зазор
gas	газ; бензин; рабочая смесь
combustible gas	горючий газ
exhaust (spent) gas	выхлопной (отработавший) газ
gasket	прокладка; уплотнение
cylinder head gasket	прокладка головки цилиндров
gasoline	бензин
gasoline-powered	с бензиновым двигателем
gear	зубчатая передача; шестерня; механизм; привод; устройство; входить в зацепление; приводить в действие
camshaft gear	шестерня распределительного вала
clutch gear	механизм сцепления; зубчатая муфта (в коробке передач)
crank gear	кривошипно-шатунный механизм
crankshaft gear	шестерня коленчатого вала
gearbox	коробка передач

govern регулировать; управлять
governor регулятор (оборотов); регулирующий клапан
grade наклон; подъем; уклон; класс, сорт, степень; марка; классифицировать
oil grade сорт (марка) масла
grease густая смазка, (консистентная) смазка; смазывать
grime глубоко въевшаяся грязь; сажа
guide направляющая (деталь), направляющее устройство; направлять; управлять; вести
gum смола; подклеивать

H

handle рукоятка; поручень; ручка; скоба; подача; манипулировать; выгружать; грузить; транспортировать; ухаживать (за механизмом, машиной)
harden закалять; твердеть; упрочнять(ся)
hardness твердость; жесткость; выносливость
haul перевозка, транспортировка, буксировка; буксировать, транспортировать
hazard [illegible], риск
head головка; насадка (верхняя или нижняя); головной
cylinder head головка цилиндра
header насадка, хедер, жатка (комбайна)
heat нагрев; тепло, теплота; нагревать
combustion heat теплота сгорания
used heat использованное тепло
waste (lost) heat потерянное тепло
heater нагреватель, нагревательный прибор,

logical concepts and optimized farming processes are needed. The efficiency of machines cannot only be measured in horsepower, tons/hour, and hectares/hour. "Clever Farming" is Pöttinger's answer to modern farmers' demands. Managing Directors Heinz and Klaus Pöttinger explain the company philosophy in the following interview:

- Pöttinger's corporate image is based on the slogan "Clever Farming". How do you define this slogan?

Heinz Pöttinger: The farmer is under pressure to lower costs and requires high performance and reliable technology to achieve ongoing cost reductions. That is why we have to offer contractors and farmers technology with which they can work even more economically. Take the self – loading wagon as an example. Although we were advised by everybody years ago not to develop a large silage wagon, even our critics are forced to admit that the self-loading wagon is the most economical silage making process for average farm conditions. The full potential of machinery is often never used with the self-propelled forage harvester process.

- You place considerable importance on the development of agricultural machines that protect the forage and soil. Which facts underline this development philosophy?

Klaus Pöttinger: We do not want to just sell machines, we want to sell systems that match the customer's requirements. High operating quality from moving to silage making, from the soil to the seed. Of course achieving high yields is closely associated with this. In future the discerning customer will be looking for optimized technology!

- The age of electronics dawned at Pöttinger long ago. The electronic plough and electronically controlled self-loading wagon are the best examples. What will Pöttinger achieve with these systems?

Klaus Pöttinger*:* electronic automation systems are designed to increase the cost effectiveness of farm machinery and

Holland bales have further specific advantages. The CropCutter versions have an integrated cutter for easier distribution of material when using the bales, and for easier mixing. The density increase of up to 10% reduces the number of bales to handle and improves silage quality where the objective is to keep air out. Whether in clamps or wrapped, New Holland silage bales will ensure production of high quality fodder. The pre-compression system assures consistent density and equal wads.

Also the straw merchant will appreciate the high density of the D1210 bales. Less bales to handle and transport means a higher payload and a substantial saving in transportation cost.

Task 140

Make a precis on the subject "Balers" (Texts 23-25). Do it both in English and in Russian. Write down the two variants.

Task 141

Look through Text 26A, state its character and say what "Clever Farming" is.

Text 26A

CLEVER FARMING – THE CONCEPT

It was the Scottish – born US inventor Alexander Graham Bell who said "Do not follow the well – trodden path – it only leads to where others have been before". This quotation sums up the current situation in agriculture. While farmers do not always regard the financial side of farming with enthusiasm, the future – oriented farm manager knows that farms need to use innovative technology to survive. Modern agricultural technology is more important than ever for farms to operate with low environmental impact and sustainability, as well as cost effectiveness.

As a result, Pöttinger bases its "Clever Farming" strategy on three columns: economical operation, soil and crop protection, and intelligent technology. That is why well thought out techno-

cab heater	обогреватель кабины
helical	винтовой, спиральный
hinge	крюк; петля; шарнир; прикреплять на петлях; вращаться на петлях; подвешивать на шарнирах
hitch	рывок; сцепка; сцепное устройство; толчок; двигаться рывками; сцеплять
hollow	полый, пустотелый
horsepower	лошадиная сила (л.с.); мощность в л.с.
hose	шланг
coolant hose	шланг для охлаждающей жидкости
fuel hose	шланг подачи топлива, топливной шланг
housing	корпус, кожух; углубление
I	
ignite	воспламенять(ся), зажигать(ся)
ignition	воспламенение, зажигание
compression ignition	воспламенение от сжатия
early ignition	раннее зажигание
late (retarded) ignition	позднее зажигание
spark ignition	искровое зажигание
impeller	рабочее колесо; насосное колесо; ротор
impurity	загрязнение, засорение; примесь
increase	увеличение, рост; увеличивать(ся), возрастать
indicate	показывать; указывать; означать
indicator	индикатор; указатель; измерительный прибор

inject	впрыскивать, вбрызгивать
injection	впрыск (топлива)
direct injection	непосредственный впрыск
injector	форсунка, инжектор
cold-start injector	дополнительная форсунка, обогащающая рабочую смесь при холодном запуске
inlet	впуск, ввод, вход; впускное отверстие; впускной
install	монтировать; устанавливать, размещать
installation	монтаж; установка, устройство
insulate	изолировать; предохранять
insulation	изоляция; изоляционный материал
insure	страховать; обеспечивать
intake	впуск, всасывание; вход; приток; впускной
iron	черный металл (железо, чугун)

J

jacket	кожух; рубашка; обшивка
cooling jacket	охлаждающая рубашка
cylinder jacket	рубашка цилиндра
water jacket	водяная рубашка
jet	струя; жиклер; насадка; сопло; форсунка; бить струей; брызгать
join	связывать, соединять
joint	связь, соединение, сочленение, стык; шов; шарнир; соединять(ся), сочленять(ся)

K

keep	держать; содержать; сохранять(ся)

2. What is the function of the centering augers?
3. What is the function of the hydraulic ram?

Task 134

Find in the text the paragraphs describing the centering augers and translate them into Russian in writing.

Task 135

Title Text 24C.

Task 136

Write a summary of Text 24C in English.

Task 137

Think of a suitable title for Texts 24.

Task 138

Write a summary of Texts 24 in English.

Task 139

Render Text 25 in Russian using no dictionary. Comment on the contents of the text. Title it.

Text 25

When designing a baler the question about the ideal bale size is predominant. The bale must be easy to handle, easy to store and easy to transport. The ideal size for a livestock farmer, who does a lot of handling in the farm, and the ideal size for the industrial big bale users, whose interest is in economy of handling and transport, are likely to be different. That's why New Holland offers you the choice. The D1010 bales are 80×90 cm and the D1210 bales 120*90 cm. Length is adjustable from 120 cm to 250 cm, allowing the operator to select the best length to suit specific transport, handling and other requirements. In addition to the choice that is being offered in cross section and bale length, New

writing.

Task 127
Title Text 24A.

Task 128
Write a summary of Text 24A in English.

Task 129
Read Text 24B using a dictionary to find answers to these questions:

1. What does the high hitch position ensure? Describe the hitch.
2. What helps the flywheel overcome variations in driveline load and maintain constant operating speed?
3. What is the central element around which the baler is built?
4. What equipment helps increase daily output? In what way?

Task 130
Find in Text 24B the paragraphs describing the PTO and the flywheel and translate them into Russian in writing.

Task 131
Title Text 24B.

Task 132
Write a summary of Text 24B.

Task 133
Read Text 24C using a dictionary to find answers to these questions:

1. Why can the new Holland big balers gather all crops?

L

lack	недостаток, нехватка; испытывать недостаток
lead	свинец; пломба; пломбировать; вести; направлять
leak	течь, утечка, протекание; течь, протекать
leakage	негерметичность, течь, утечка, просачивание, протекание
leg	опора; подставка
level	уровень; горизонтальная поверхность; выравнивать
correct level	нормальный (надлежащий) уровень
lever	балансир; рычаг; плечо рычага
life	долговечность, срок службы
design life	расчетный срок службы
service life	эксплуатационный срок службы
lifetime	долговечность, срок службы
lift	поднятие, подъем; подъемный механизм, подъемник; подъемная сила; поднимать(ся)
line	линия; магистраль; трубопровод; облицовка; облицовывать
fuel return line	трубопровод возврата топлива
fuel supply line	трубопровод подачи топлива
linear	линейный, прямолинейный
lined	облицованный, обшитый
load	груз; заряд; нагрузка; грузить
loader	погрузчик
locate	определять место (местонахождение);

location	размещение, расположение
lock	замок, запор, стопор; фиксатор; стопорить; блокировать
air lock	воздушная пробка
long-wearing	износостойкий
loose	имеющий люфт, незатянутый, разболтанный; ослаблять
loosen	ослаблять; открeплять, развинчивать; расшатывать
loss	потери, убыток
lubricant	смазка (вещество)
consistent (grease) lubricant	консистентная смазка, густая смазка
liquid lubricant	жидкая смазка
lubricate	смазывать
lubrication	смазка (процесс)
forced (pressure) lubrication	принудительная смазка, смазка под давлением
oil lubrication	смазка маслом
splash lubrication	смазка разбрызгиванием

M

maintain	обслуживать, содержать, поддерживать (в работоспособном состоянии)
maintenance	техническое обслуживание, текущий ремонт; уход
manifold	коллектор; патрубок; трубопровод
air manifold	воздухопровод
fuel manifold	трубопровод для подачи топлива к форсункам
manufacture	изготовление, производство; изготовлять, производить

Task 125

Read Text 24A using a dictionary to find answers to these questions:

1. What features have been incorporated into New Holland Big Baler?
2. What is the main idea of the New Holland Baler pre-compression system?
3. What does the double knotting system of the New Holland Big Balers assure?
4. What are the bale sizes produced by the New Holland Big Balers?

Task 126

Find in Text 24A the paragraph describing the Crop-Cutter versions of the balers and translate it into Russian in

Leaf loss is minimized and even the shortest crop is picked up. The adjustable windguard extends well over the entire pick-up width and towards the packer forks. There are two centering augers which are undershot for consistent functioning in all crops and crop conditions.

These centering augers bring the edges of the windrow in the line with the bale width. This neatly fills the sides of the feeding chamber resulting in solid, well formed edges for excellent bale shape and appearance. The pick-up and augers are protected by a slip clutch. Two adjustable pneumatic gauge wheels allow you to follow the contours of the ground. This helps a clean pick-up of the crop and prevents tine damage.

Pick-up chains and pick-up floatation springs are adjustable to suit field conditions and the pick-up can be raised using a single acting hydraulic ram, controlled from the tractor seat.

manufacturer	изготовитель, фирма-изготовитель (производитель)
mark	знак, метка, риска, отметка; марка; маркировать
matter, foreign	посторонняя примесь
matter (material)	
measure	масштаб; мера; размер; измерять
meter	измерительный прибор; счетчик; метр; измерять; дозировать
mix	мешать, смешивать
mixture	смесь
air-fuel	
(fuel-air) mixture	горючая (топливная) смесь
motion	движение, перемещение
mount	монтировать, устанавливать; навешивать; насаживать
move	движение, передвижение; двигаться, передвигаться
movement	движение, передвижение; ход
directional	
movement	направленное движение
muffler	глушитель
multiple	многократный; сложный, составной
multiple-cylinder	многоцилиндровый

N

noise	шум, грохот, треск
noiseless	бесшумный, тихий
nozzle	жиклер; сопло; форсунка; выпускное отверстие
injection nozzle	сопло, (распылитель) форсунки

O

oil	нефть; смазочное масло, жидкая смазка; смазывать
crude oil	сырая нефть
multi – grade oil	всесезонное масло
single – grade oil	односезонное масло
used (waste) oil	отработавшее масло
open	открытый; разомкнутый; размыкать
opening	отверстие, окно; просвет
operate	обслуживать, эксплуатировать; приводить в действие (движение)
operated	приводимый в действие; управляемый
operation	операция, работа; эксплуатация; управление машиной
option	выбор, право выбора; условие
optional	заказной, поставленный по выбору (требованию, заказу) покупателя
output	выходной сигнал; мощность; мощность на выходе, отдаваемая мощность; производительность
overcooling	переохлаждение
overheating	перегрев

P

paint	краска; окраска; красить, окрашивать
panel	обшивка, панель; приборный щиток
part	деталь; часть; разделять (на части)
fixed part	несъемная деталь
removable part	съемная деталь
replacement part	запасная деталь, сменная деталь
particle	частица

The huge flywheel has a big diameter and weighs 220 kg on the Model 1010 and 250 kg on the Model 1210. It has sufficient inertia to overcome variations in driveline load and helps maintain constant operating speed. It is driven via an overrun and slip clutch assembly with a shearbolt, to protect the main gearbox and other drive components from overload. The gearbox is the central element around which the machine is built and from where all components are driven. It has oil-immersed reduction gears with large tooth contact area and it slows down the 1000 rpm PTO input to the 42 rpm drive to the plunger crank.

The plunger is driven directly from the gearbox. No chain to worry about, no baler timing concerns or chain maintenance.

The balers are equipped with a suitable axle and brake assembly that enables towing at 40 kph (where traffic laws allow) reducing non-productive transport time and increasing daily output. Hydraulic brakes and mechanical parking brake are standard equipment. So is the flywheel brake.

Text 24C

The wide pick-up assembly with closely spaced spring tines offers perfect gathering of all crops. The 270 mm diameter pick-up reel helps gentle lifting of crop into the baler.

whatever the application. The D710 Silage baler is the smallest model in the range. Bale size is 80×47 cm, but the optional accumulator allows you to make stacks of two, forming a package of 80×94 cm. This brings us to the bale size level of the bigger models D1010 Silage and D1010 CropCutter. They produce bales of 80×90 cm. Add 50% to this bale size and you get to the D1210 Silage and D1210 CropCutter, which produce bales of 120×90cm

.

Text 24B

When attaching the New Holland big baler to your tractor, you can always adjust it to an optimum operating position. The heavy-duty hitch is adjustable in height, so that the machine is always level for optimum performance in the field. Standard on the D1210 CropCutter and optional on the other models, is the possibility to turn the drawbar around so that it sits above the PTO. This high hitch position ensures an undesturbed flow of material to the pick-up.

A wide angle PTO, supported half-way, is easy to fit and takes care of a smooth, vibration-free power transmission.

pass	переход, проход, проходное отверстие; проходить, проезжать
passage	канал; переход; проезд, проход, путь
payload	грузоподъемность, полезная нагрузка
perform	исполнять, выполнять, производить
performance	производительность; работа (машины); эксплуатационные качества; кпд; характеристика
petrol	бензин; заливать баки (топливом)
piece	деталь; часть
pin	(поршневой) палец; шплинт; штифт; шейка; шип; цапфа; зашплинтовывать
piston pin	поршневой палец
pipe	труба, трубка; трубопровод
piston	поршень; плунжер
plant	агрегат; завод; комплект (машин); установка
plate	пластина, плита; листовой металл
plug	свеча зажигания; заглушка, пробка
drain plug	пробка сливного отверстия
glow plug	запальная свеча, свеча накаливания
ignition (spark) plug	свеча зажигания
plunger	плунжер
point	точка; пункт; центр; нацеливать
port	канал, проход; окно, отверстие;
power	мощность, сила, энергия; приводить в действие
pulling power	мощность на крюке, тяговое усилие
power-actuated (driven)	с механическим приводом, самоходный
powered	автоматический, механизированный
powertrain	силовая передача, трансмиссия

prechamber	аванкамера, предкамера, форкамера
precise	точный; четкий
precision	точность; точный, прецизионный
pressure	давление
compression pressure	давление сжатия
piston pressure	давление на поршень
service pressure	рабочее давление
pressurize	нагнетать, повышать давление
pressurized	под давлением
prevent	предупреждать, предотвращать, предохранять
prevention	предупреждение, предотвращение, предохранение
procedure	методика, процедура, порядок действия
produce	продукт, продукция; вырабатывать, производить, изготавливать
protect	защищать, предохранять
pull	натяжение, растяжение; тяга
belt pull	натяжение ремня
pulley	блок; шкив
pump	насос; накачивать, нагнетать
air pump	воздушный (пневматический) насос
coolant pump	насос системы охлаждения
diesel fuel injection pump	топливный насос высокого давления
transfer pump	подкачивающий насос

Q

quality	качество; свойство; класс, сорт
design quality	конструктивное качество
quiet	тихий, бесшумный

Find in Text 23 the paragraphs describing the new RS561 baler and translate them into Russian in writing.

Task 122
Title Text 23.

Task 123
Write a summary of Text 23 in English.

Task 124
Look through Texts 24 A, B, C and say why they are numbered by the same figure and what is in common between these texts and Text 23. What is the difference?

Text 24A

New Holland offers the widest range of big balers on the market. These balers have been designed for the highest baling capacity and constructed for years of dependable field work. State-of-the-art features, based on years of experience, on continued research and development and on valuable customer input, have been incorporated into these balers. There are a lot of exclusive features, not surprising for the company that was actively involved with the start of mechanical baling, be it in small or large bales.

These features are unique and make New Holland Big Balers so attractive, whatever the crop is. For optimum and consistent bale shape and density in all crops, the D1010 and D1210 have the exclusive and patented pre-compression system: the crop is kept in a feeding chamber until there is enough of it, and only when a certain pressure is reached, it is pushed into the bale chamber. Another exclusive feature is the patented double knotting system, which assures secure tying of the highest density bales. And now there are the CropCutter versions of the bigger models, which combine enormous field capacity with very short cut and high bale density. The result is a dense bale, solid to handle and easy to use,

This new baler offers a choice of auto eject or auto wrap functions. With auto eject just push a button to wrap the bale with twine (or mesh wrap if equipped) and eject it automatically. With auto wrap, the baler automatically starts wrapping with twine (or mesh wrap if equipped) when the bale reaches full size. Then simply push a button to activate the tailgate and bale kicker to put the bale where you want it.

Both auto eject and auto wrap functions can be activated by pushing a button on the control console or on the industry's first handheld remote control. The simple-to-use control console activates all other functions, including hydraulic lift and lower for the extra-wide pickup.

No-hydraulic hoses to hook up – just plug in the electrical harness, hook up the PTO, and you're ready to run.

With all drives and tension arms on one side, the RS Series round balers also offer simplified access to adjustments. What's more, you can choose from two advanced options that help you get more done in a day and provide protection for your bales – an extra – wide mesh- wrap system and the industry's first enclosed preservative tank system.

Task 120

Read Text 23 using a dictionary to find answers to these questions:

1. What do the RS "One" Series round balers feature?
2. What balers can you rely on for square bales?
3. What do self-propelled windrowers from Case IH feature?
4. What functions does the new RS561 Auto-Cycle round baler offer?
5. What are the technical characteristics of the new RS561 baler?

Task 121

quietness	бесшумность, покой, тишина
R	
radiate	излучать
radiator	радиатор
rail	балка, брус; перила, поручень; рельс; направляющая
fuel rail	топливная рампа (аккумулятор)
range	диапазон, радиус действия; ряд; расстояние; серия; ставить в ряд
range of speed	диапазон скорости
range of vision (visibility)	поле зрения, предел видимости
operating range	рабочий диапазон
rate	величина; расход; скорость; интенсивность; норма; степень; стоимость
rated	номинальный; расчетный; запроектированный
ratio	отношение; передаточное число; пропорция; степень
compression ratio	степень сжатия
rear	задняя часть; задний, тыльный
recirculation	циркуляция в замкнутом контуре (цикле), рециркуляция
reduce	понижать, редуцировать; сокращать, уменьшать
reduction	понижение, редукция, сокращение; уменьшение
pressure reduction	снижение давления
speed reduction	снижение скорости
reel	барабан, бобина, катушка, мотовило; наматывать

refill дозаправка, доливка; доливать
reflect отражать
refuel дозаправлять топливом
regulate регулировать
regulation инструкция, правило; регулировка; управление; **–s** технические нормы, технические условия
release освобождение; размыкание, разъединение; размыкающий механизм; размыкать, разъединять
reliability безотказность, надежность, прочность
reliable безотказный, надежный, прочный
remove перемещение, перемена (места); перемещать, удалять, устранять
repair починка, ремонт; ремонтировать
capital (major) repair капитальный ремонт
emergency repair неотложный ремонт
light (operating) repair текущий ремонт
minor repair мелкий ремонт
warranty repair гарантийный ремонт
replace заменять, сменять
require обусловливать, требовать
requirements требования
residue осадок, отстой, остаток
resistance сопротивление; устойчивость
response отдача; реакция; характеристика; чувствительность
restrict ограничивать
rigid жесткий; устойчивый
ring кольцо, круг, обод
oil (wiper) ring маслосъемное кольцо

Task 119

Look through the first paragraph of Text 23 and say what machines are described in the text.

Text 23

When it comes to hay and forage equipment, Case IH offers a full family of round and square balers, disc and sicklebar mower conditioners, plus self-propelled and pull-type windrowers, silage bale wrappers and processors. With all these choices, it's easy to find reliable solutions to simplify your haying season. New advancements from balers to windrowers help boost your productivity with added conveniences and versatility.

The RS "One" Series round balers feature extra-wide standard pickups for gathering the fullest windrows and packing the sides of the bale for solid, square-shouldered results. The new RS 561 Auto-Cycle baler offers simplified wrapping and ejection with the push of a button.

For square bales built to stack like bricks, rely on Case IH small and large square balers. With heavy-duty construction and durable designs, these models can handle the high-volume stress of nonstop baling. And a new powerful knotter fan for large-square models helps keep knots on track for building high-density 3×3, 3×4, or 4×4 bales.

With a full line of disc and sicklebar mower conditioners, Case IH gives you an efficient way to make higher-quality hay. Choose from a number of center-pivot and side-pull models in working width up to 16 ft. (4.9 m) for productive cutting and conditioning.

Self-propelled windrowers from Case IH feature new Cabs designed for operator comfort and convinience. Match one of four productive models with you choice of several efficient header designs for maximum harvesting performance.

The new RS561 Auto-Cycle round baler from Case IH helps boost your productivity and reduce operator fatigue.

Purchasing a combine is a complex process, weighing up the features and specifications, making the right decision. New Holland's experience has shown that the service and support offered after the sale are also important parts of the equation. New Holland's worldwide dealer network offers the service and support to improve your productivity and to give you a better return on your investment. TX combines have been designed for easy maintenance. All important areas are easily accessible and clever features have been built into these products to limit your downtime to a minimum. The attention to detail incorporated into the operating requirements of the TX combines is a further proof of New Holland listening to and learning from customers. Extensive training courses are conducted for New Holland dealership personnel, providing information and practical training on the TX combines.

New Holland's product support includes its extensive replacement parts warehouses, offering state-of-the-art systems technology. System designed to get the parts to you in no time. New Holland endeavours to provide the complete package supported by one of the leading dealer networks in the world which, in turn, is supported by New Holland's commitment to customer satisfaction.

Task 117

Make a precis on the subject "New Holland TX Combines" (Texts 20-22). Do it both in English and in Russian. Write down the two variants.

Task 118

Make a precis on the subject "Grain Combine Harvesters" (Texts 16-22). Pay special attention to the difference between conventional and rotary (Axial-Flow) combines.

Write down the English and the Russian variants of the

.

piston ring	поршневое кольцо
pressure (compression) ring	компрессионное кольцо, уплотнительное кольцо
retaining ring	удерживающее (стопорное) кольцо
rise	повышение, подъем, повышаться, подниматься
rod	пруток, стержень, штанга, шток; тяга
connecting rod	шатун
roller	барабан, валик, ролик; иголка (подшипника); каток
rotary	вращающийся, поворотный, роторный
rotate	вращать(ся)
rubber	резина
run	движение, работа (о машине); пробег, ход; приводить в движение; работать (о машине)
running	движение; пробег, ход; эксплуатация; эксплуатационный
rust	ржавчина; ржаветь
rusty	ржавый
S	
scale	масштаб, шкала; нагар, накипь, окалина; очищать
scrap	(металло)лом
scraper	скребок; скрепер
screen	жалюзи; сетчатый фильтр; щит, экран; защищать; экранировать
screw	болт, винт, червяк; шнек; шуруп; ввинчивать, завинчивать
seal	пломба; уплотнение; **-in** герметизировать; пломбировать;

sealing	герметизация, уплотнение, закупорка; пломбирование
seat	опорная поверхность; седло (гнездо) клапана; посадка; опираться
adjustable seat	регулируемое сиденье
security	безопасность
sediment	осадок, отстой (масла, топлива)
sedimentation	осаждение, отстаивание, отстой
sensor	датчик, чувствительный элемент
sequence	последовательность, порядок
service	обслуживание; работа; срок службы; эксплуатация; обслуживать
shaft	вал; ось; стержень; шпиндель
drive shaft	ведущий вал
driven shaft	ведомый вал
power take-off shaft	вал отбора мощности
shaking	вибрация, дрожание; удар
shape	форма, конфигурация, профиль; придавать форму
shield	кожух, щиток, экран; защищать, заслонять, экранировать
shock	сотрясение, толчок, удар
shop	мастерская, цех
shroud	каркас; кожух, колпак
shut off	выключенный; выключать, отключать
shutter	задвижка, заслонка, затвор, жалюзи
shutters	жалюзи
side	бок, борт, край, сторона; бортовой
size	величина, размер
sleeve	втулка; гильза (цилиндра); муфта; патрубок

Task 111

Read Text 21E using a dictionary to answer this question:

Are TX combines designed for easy maintenance?

Give your reasons.

Task 112

Title Text 21E.

Task 113

Write a summary of Text 21E in Russian.

Task 114

Think of a suitable title for Texts 21.

Task 115

Write a summary of Texts 21 in English.

Task 116

Render Text 22 in Russian using no dictionary. Comment on the contents of the text.

Text 22

A BETTER RETURN ON YOUR INVESTMENT

New Holland TX combines are designed for maximum versatility, that means they are built to harvest a wide range of crops under a variety of conditions. To further enhance their high capacity cutting, threshing, separating and cleaning capabilities, your New Holland dealer can recommend optional equipment and attachments that will enable you to "custom build" your TX combine to fit your exact needs.

features of the TX combines threshing and separation systems and translate them into Russian in writing.

Task 102
Title text 21B.

Task 103
Write a summary of Text 21B in English.

Task 104
Read Text 21C using a dictionary to name the main features of the Discovery Cab.

Task 105
Find in the text the paragraphs describing the Discovery Cab seats, controls and information systems and translate them into Russian in writing.

Task 106
Title Text 21C.

Task 107
Write a summary of Text 21C in English.

Task 108
Read Text 21D using a dictionary to describe the TX combines engines in Russian.

Task 109
Title Text 21D.

Task 110
Write a summary of text 21D in English.

sliding	ползун; проскальзывание, скольжение; проскальзывающий, скользящий
slip	буксовка, проскальзывание, скольжение; буксовать, проскальзывать, скользить
smoky exhaust	дымный выпуск (выхлоп)
smooth	гладкий; плавный; ровный
soften	смягчать
solenoid	соленоид (электромагнит)
solvent	растворитель
soot	копоть, сажа
space	зазор, интервал, промежуток; пространство
spark	искра, вспышка
specification	спецификация, техническая характеристика; **-s** технические условия
speed	скорость, число оборотов; ускорять
spline	паз; шлица; шпонка
spray	брызги, распылитель, струя; разбрызгивать, распылять
spring	пружина, рессора; пружинить, подрессоривать
standard	норматив, стандарт; серийный, стандартный
start	запуск, трогание; запускать, трогаться
stop	остановка; ограничитель (хода), стопор, упор; задерживать; останавливать
storage	аккумулирование; емкость; запас; хранение
store	запас; склад; запасать, складировать
spare parts store	склад запасных частей

stroke	такт, ход
admission (intake) stroke	ход (такт) впуска (всасывания)
combustion (power) stroke	рабочий такт, рабочий ход, ход (такт) расширения
compression (pressure) stroke	ход (такт) сжатия
ejection (exhaust) stroke	ход (такт) выпуска
expansion (firing) stroke	рабочий ход, ход (такт) расширения
sump	поддон, отстой
crankcase sump	поддон картера двигателя
supply	питание, подача; подвод (топлива, смазки и т.п.); питать, подводить, снабжать
support	держатель, опора, опорная стойка, суппорт
surface	поверхность
suspension	подвеска
swirl	вихрь, завихрение
switch	выключатель, переключатель; выключать, переключать
system	система
air induction system	система впуска воздуха
brake system	тормозная система
control system	система управления
cooling system	система охлаждения
exhaust system	система выпуска отработавших газов
fuel (supply) system	система подачи топлива, топливная система

Combine. Clean out provisions on graintank and returns augers allow perfect cleaning when harvesting seed crops. Total accessibility has really been built into these TX combines, reducing daily maintenance time by half.

Task 96

Read Text 21A using a dictionary to find answers to these questions:

1. What is the maximum power level of the new TX combines?
2. What are the reasons of being sure that the new TX combines will perfectly suit everybody's needs?
3. Why does the maintenance of TX combines seem simple and easy?
4. What are the main features of TX combines?
5. What can you tell about the generation of headers used with TX combines?

Task 97

Find in the text the paragraph describing the six bar reel and translate it into Russian in writing.

Task 98

Title Text 21A.

Task 99

Write a summary of Text 21A in English.

Task 100

Read Text 21B using a dictionary to state the type of TX Combines: conventional, rotary.

Task 101

Find in the text the paragraphs describing the main fea-

puts four speed ranges right at your fingertips. A push button on the gearshaft lever allows you to depressurize the hydrostatic system to provide easier gear shifting. On the Model TX67 the remote gear shifting is a further addition to comfort and ease of operation. Changing speed within a range is smooth and instantaneous. A single movement of the hydrostatic lever lets you change from fuel speed to stop, or go from forward to reverse within any of the four ranges. The ease of shifting is specially useful in severe field conditions. The in-cab electrical throttle and engine stop controls further contribute to ease of operation. In muddy or slippery conditions, the differential lock available as an option on all models can improve traction as well as enhancing safety when working on slopes. For improved manoeuverability, an adjustable steering axle is available as an option on some models and standard on others. To allow you to fit bigger steering wheels, a reinforced adjustable rear axle is also available as an option on most models. Powered rear wheels, providing greater traction and pulling power in adverse conditions, are optional on all models.

Text 21E

Easy of maintenance has built into the TX Combine range. Large shields supported by gas sturts give easy access from both sides.

The 3-point hitch attachment allows you to quickly remove the straw elevator. Swinging down access to grainpan and concave. The beater is easily accessible from the graintank and there is a strawwalker inspection door in the strawhood. The pre-sieve can be adjusted via a handy access door on the right-hand side. A battery isolator switch offers extra security. The central electric system can easily be inspected via a door on the right-hand side and the brake and gear shift linkage systems are accessible when opening the right-hand side cab door. An optional air compressor kit is available to help you for the daily maintenance of your TX Combine. Clean out provisions on graintank and returns augers

Global Positioning System (GPS)	Всемирная навигационная система
ignition system	система зажигания
injection system	система впрыска
intake system	система впуска
lighting system	система освещения
lubricating system	система смазки
starting system	система пуска, пусковая система
steering system	система рулевого управления
T	
tail	хвост, хвостовик, хвостовая (задняя) часть; задний, хвостовой
tank	бак, емкость, резервуар, цистерна
fuel tank	топливный бак, цистерна для топлива
tappet	кулачок, эксцентрик; толкатель (клапана)
thermostat	термостат
throttle	дроссель; дросселировать, суживать
time	время, период, срок, рассчитывать (регулировать) по времени
tool	инструмент, орудие
torque	крутящий момент
touch	касание, прикосновение; касаться, прикасаться
track	гусеница, звено гусеничной цепи; колея, путь; след
traction	сила тяги, тяговое усилие
tractor	тягач, трактор
caterpillar tractor **crawler tractor** **track layer(-type) tractor**	гусеничный трактор

wheel (-type) tractor	колесный трактор
general (all) purpose tractor	универсальный трактор, пропашной трактор
utility tractor	трактор общего назначения
trailer	прицеп
transfer	перенос, передача, транспортировка; переносить, передавать, транспортировать
heat transfer	перераспределение (перенос) тепла, теплопередача, теплопроводность
transmission	коробка передач, передача; привод; трансмиссия
planetary transmission	планетарная коробка передач, планетарная передача
powershift transmission	коробка передач с переключением под нагрузкой (*с использованием сервопривода*)
transmit	передавать
trouble	авария; дефект; неисправность, повреждение; помеха, перебой (в работе)
truck	грузовой автомобиль, грузовик
tube	труба, трубка; камера шины; шланг
tubing	система труб, трубопровод
turbocharger	турбокомпрессор, турбонагнетатель
turbocharging	турбонаддув
turbodiesel	дизельный двигатель (дизель) с турбонаддувом
turn	виток, оборот; поворот; поворачивать(ся); вращать(ся); вспахивать (плугом)

Text 21D

In the final analysis, combine capacity depends to a large degree on engine power and efficiency. The TX combine engines are emissionized, in line with the emission norms set up by the authorities for January 1, 2003. This emissionizing required technical adaptations, forcing our engineers to review components and their speed, and allowing them to introduce characteristics providing optimum torque and power, yet maintaining good fuel efficiency. The Iveco engines on the models TX68 and TX68Plus produce 206 and 228 KW (280 and 310 hp), running at only 2100 rpm for lower friction and better power efficiency, and for lower fuel consumption. All other TX models have New Holland engines with maximum power ranging from 152 to 191 KW (206 to 260 hp). This range of engines has been specially designed for agricultural and industrial applications. Fuel efficiency, combined with large fuel tanks on all models will provide a full day's work, without time-robbing re-fuelling. The four-speed hydrostatic drive

tem requires low effort, yet the operator retains excellent "feel" for easy and efficient operation.

Also the brake pedals and the optional differential lock pedal have been positioned for the most comfortable operation. That's why we can truly say that the Discovery Cab offers you the ultimate in operator's comfort. But not all is said and done, let's have a look at the instrumentation and controls.

There is a lot to keep track of when you are operating a combine. That's why controls and information systems have been grouped for simplified operation. Your primary source of information on the complete harvesting process is the InfoView monitor. The monitor is calibrated to your combine's configuration and constantly monitors the harvestings process. The RPM monitor has sensors for drum, cleaning fan, grain elevator, heater, Rotary Separator, returns system and strawwalker, optional straw chopper rpm control can be included. The lateral float indicator provides a continuous display of the degree of header tilt in relation to the combine.

Electro-hydraulic remote controls engage header, threshing system and unloading auger swing. The Multi-control lever combines controls for all header functions and the hydraulic feeder reverser. On the TX67 gear shifting is electrically controlled, for a simplified shifting manoeuvre. Following functions are also electrically controlled from the instrument panel at the right-hand side of the operator: electric engine throttle control, drum speed variator, fan speed variator, synchronized reel speed, electric feeder reverser, straw chopper engagement, worklights, flashing lights, powered rear wheel engagement and an engine safety device. A number of warning lights alert the operator in case of malfunction. All the instrumentation has been ergonomically laid out, in priority sequence, so that all buttons are easy to reach and lights are easy to see. Total operator control has become a reality in the New Holland Discovery Cab.

U

unit	агрегат, блок; единица (величины); единица (измерения); комплект; секция; узел; установка
control unit	регулирующее устройство
power unit	блок питания; единица мощности; силовой агрегат, силовая установка
usage (use)	эксплуатация

V

valve	вентиль, задвижка, заслонка; золотник; клапан; распределительный кран, кран
admission (intake) valve	впускной клапан
exhaust valve	выпускной клапан
solenoid valve	электромагнитный клапан
vane	лопатка, лопасть, направляющая, флюгер
vapor	пар; испарять(ся)
vaporize	выпаривать(ся), испарять(ся)
vehicle	транспортное средство
velocity	скорость
vessel	баллон, резервуар, сосуд; судно
vibrate	вибрировать, дрожать, колебать(ся)
viscosity	вязкость; клейкость
visibility	видимость, доступность (для просмотра), обзорность
visible	видимый, визуальный
volatile	летучий, быстроиспаряющийся

volume	вместимость, емкость, объем
combustion volume	объем камеры сгорания
cylinder volume	рабочий объем цилиндра

W

wall	обрез борозды; стенка
cylinder wall	стенка цилиндра
warm	нагревание; теплота; прогретый, теплый; нагревать, прогревать
warming(up)	подогрев, прогревание (двигателя)
washer	моечная установка, промыватель; прокладка; шайба
washing	мытье, промывка
waste	отходы; порча; потеря; выхлопной; отработанный; отходящий
waste gate	перепускная заслонка для отработавших газов, регулятор давления наддува
wave	волна
wear	износ; **-off(out)** изнашивать(ся)
wear-proof	износостойкий
weight	вес, масса; груз, нагрузка
wheel	колесо; шестерня; катить(ся); поворачивать(ся)
drive wheel	ведущее колесо
driven wheel	ведомое колесо
front wheel	переднее колесо
gear wheel	ведомая шестерня, зубчатое колесо (шестерня)
rear wheel	заднее колесо
traction (transport) wheel	ведущее (транспортное) колесо

deliver maximum comfort and ultimate operator control. The Discovery Cab will allow you to keep your combine operating at full efficiency throughout the longest working day. Inside, the cab is large and roomy. The deluxe, contoured seat provides firm support and has adjustable suspension to reduce the shocks and bumps of field conditions.

Multiple adjustments allow you to place the seat where you can reach all of the operational controls without straining or stretching. The seat has 3 height settings and up to 15 cm of fore-and-aft-travel. The angle of the seat back is also adjustable. An air suspension seat is available as an option on Models TX64 Plus, TX65 Plus, TX66 and TX67; it is standard on the TX68 and TX68 Plus. A fold-down passenger seat is standard equipment, except for TX62 and TX63. The adjustable steering column can be placed exactly where it is most comfortable. The height is adjustable over 8cm through a telescopic system. The top section can be tilted infinitely over 40 degrees. Noise and vibration can cause operator fatigue. So a lot of effort has been made to block out both. The Discovery Cab is positioned away from the engine with the graintank acting as a sound barrier between the engine and the cab. Layers of sound deadening material also keep out additional noise. To cut down further on possible vibration, the cab is isolated from the combine frame and is mounted on silent blocks. Surely, with a noise level of only 76dBH, this must be the quietest cab in the industry. The large windscreen wiper will maintain a clear view when working in bad weather conditions. And an integrated sun shade will keep out excessive brightness. Electrically controlled mirrors allow you to adapt your area of view instantly. Standard mirror heating allows for easy demisting on a damp morning. Your refreshments are kept cool in a coolbox under your seat. Radio and CD are pre-wired and radio antenna and 2 loudspeakers come as standard equipment. Really everything has been taken care of. Fingertip Hydrostatic Steering provides quick and accurate control of the combine even on rough ground. The sys-

InfoView monitor (not on TX62 and TX63). The optional drum speed reducer allows you to match drum speed to special crop conditions, down to 190rpm. When the crop leaves the drum, it is directed to the five-blade beater with its efficient concave. This large diameter beater is synchronized to run at two-thirds the speed of the threshing drum which minimizes cracking of grain.

The crop is then directed to the famous New Holland Rotary Separator. Often initiated but never equaled, it greatly increases the separation action and the rubbing area. Nearly all the grain is extracted before discharge onto the strawwalker. Two speed settings allow you to quickly adapt to changing harvesting requirements.

The Multi-Thresh system allows you to easily switch beater and Rotary Separator concaves from high to low position to suit different crops and harvesting conditions. The Straw Flow beater then guides the crop quickly and efficiently to the front section of the strawwalkers. This maximizes material throughput and contributes to increased efficiency of the strawwalkers, on which final separation takes place. TX strawwalkers have five, sharply angled steps. Their tapered bottom design offers even distribution of the material to the grainpan, when working on slopes. Riding on sealed ball bearings, these strawwalkers will provide reliability season-after-season.

The double returns system on the 6-strawwalker models brings tailings back to the grainpan from both left-and right-hand side. The other models feature the single returns system on the left-hand side. A sensor system gives constant in-cab feedback to the operator on the level of returns for both the singe and double returns systems.

Text 21C

On all eight TX combine models, New Holland fits a fantastic generation of cabs – the Discovery Cab – designed to deliver

windshield	ветровое (переднее) стекло
wing	выступ; крыло
front wing	переднее крыло
rear wing	заднее крыло
wiring	(электро)проводка
X	
X - engine	двигатель с X – образным расположением цилиндров
X – frame	рама с крестообразной поперечиной
Y	
year	год
current year	текущий год
Z	
zone	зона, пояс, участок
zone of adhesion	зона сцепления (притяжения, трения)

UNIT 2
FARM TRACTORS

The purpose of this Unit is to provide farm mechanization students with some information on their future profession which is concerned with Farm Tractors.

The texts included in the Unit provide an opportunity to get acquainted, to some extent, with this fascinating world: you will learn some facts from the history of tractor development, read about some greatest tractor manufacturers and their best models; the future of power farming is also the topic of this Unit.

Task 1

Read the title of Text 1 and try to predict its possible contents.

Task 2

Look through Text 1 and see if you are right.

Text 1

WHAT IS A FARM TRACTOR?

Tractors are widely used in agriculture as a source of mobile power. They find their use in a wide variety of farm jobs such as plowing, disking, planting, cultivating, fertilizing, harvesting, transport works and running machinery off the PTO shaft.

According to the work that the farm tractor is designed to perform, it is provided with such features which enable it to perform the particular work with the highest efficiency.

To make a farm tractor that would perform all the works with the same efficiency and economy is impossible because farming conditions and requirements are very different in different regions. As a result there are many types and kinds of tractors from which to make a selection.

takes of an exceptionally smooth feeding. Full width retractable tines are available on all header sizes. Auger tine guides are made of synthetic material to reduce noise. A slip clutch on the drive protects the feed auger against overload. The slip clutch on the auger has been improved to allow 30% higher torque whilst maintaining protection against overload.

Text 21B

The efficient, large diameter threshing drum has eight rasp bars, mounted on a heavy-duty steel frame. Its dimensions and weight assure a good flywheel action to smooth out peak loads. On Models TX68 and TX68 Plus, the posi-torque drum drive ensures there is no belt slippage and maximizes power transmission. A 101 degree concave wrap provides extra-large threshing and separation area. The concave can be electrically adjusted from the cab and its position can be observed on the InfoView monitor (not

are numbered by the same figure and what is in common between these texts and Text 20. What is the difference?

Text 21 A

The new range of TX combines consists of 8 models - with maximum power levels ranging from 206 to 310 hp. From headers to threshing and separation and cleaning systems up to graintank sizes, each component is designed to deliver a pre-determined capacity rating.

Harvesting capacity begins upfront with a complete generation of advanced headers. To be able to profit from the increased capacity of the new range of TX combines, the top models can now be fitted with a 9.5 m header. All headers provide a host of features that help you keep up productivity day after day. The square beam at the rear gives the new Holland header frame extra strength and rigidity. Side sheets are specially strengthened to stand up to continued high-capacity operation. Strong steel center supports give extra rigidity. Full-width skids eliminate bulldozing and protect the under side of the header. An optional feed plate with stone protection profile is available to prevent stones from entering the header. Header attachment is quick and easy. The quick release PTO shaft, and the optional Faster coupler which groups all hydraulic connections in one block reduce header connecting and disconnecting times.

The large diameter six bar reel is painted matt black to eliminate glare and reflections. The reel lift cylinders have a long stroke for extra high reel lift in special crops such as rapeseed. Reel tine angle is adjustable over 180 degrees, allowing optimum tine setting in all crop conditions. Angle adjustment is done without tools. Replacing tines is easy because they are mounted in pairs. The feed auger is designed for high capacity operation. The tube diameter is 360 mm and with flights of 125 mm high the total auger diameter reaches 610 mm. These dimensions, in combination with extra long retractable tines, assure that the auger takes of

trailing farm machinery and implement, utility tractors, which are suitable for most all farm work, row-crop tractors for cultivating row crops and garden (orchard) tractors for work in gardens or orchards.

As to the design of the driver the tractors may belong either to wheeled-type tractors or to track-laying type, often called crawlers.

Today's tractors are powerful, sophisticated machines. Equipped with a vast array of hi-tech features, including satellite navigation, high-capacity hydraulics, powershift transmissions and vibration-insulating cabs, they are designed to meet the ever-increasing demands of intensive modern agriculture.

Task 3

Read Text 1 using a dictionary. Memorize the terms on the subject. Answer these questions:

1. What are the jobs a farm tractor is designed to perform?
2. What does the abbreviation "PTO" mean?
3. Why is it impossible to make a farm tractor for performing all the works in agriculture?
4. What are the main types and kinds of a farm tractor?
5. How can you describe today's tractors?

Task 4

Find in Text 1 the paragraph describing today's tractors and translate it into Russian in writing.

Task 5

Write an annotation of the text in English.

Task 6

Read the title of Text 2. Translate it into English.

Task 7

Read Text 2 to find answers to the question: "What are the main components of a farm tractor?". You should use a dictionary.

Text 2

COMPONENTS OF THE TRACTOR

The construction of the tractor, regardless of its application, is quite established and includes definite devices and assemblies.

The arrangement of some of these devices and assemblies may be different, but it is possible to illustrate general purpose tractors and some special tractors by a few representatives.

The construction of a tractor incorporates the following main units and assemblies:

1. **Power unit** including the engine with all its auxiliary devices-radiator, fan, starter device, fuel tank, pumps, etc.

2. **Transmission assembly** which consists of a clutch, a speed control unit, central gearing mechanism, universal joints, shafts, differentials or steering mechanism in track-laying tractors, final drives, axles. Transmission is designed for transmitting the torque of the engine to the tractor driving wheels and also to different working and auxiliary equipment.

3. **Driver** including driving, supporting and controlling mechanisms and serving for converting the rotary movement of the tractor driving wheels into the forward propelling of the tractor, and also for the tractor body support.

4. **Steering unit** which includes devices and drives to them, by means of which the operator may control the work of the tractor as a whole and of its separate units.

By means of the **steering device** the tractor may be caused to move, to change the direction and speed of the movement, to stop on steep hills and grades.

5. The **tractor frame** including the parts to which different tractor assemblies are secured.

But the biggest revelation in this range of combines is the Discovery Cab. A whole new world of comfort is waiting for you. Special attention was given to every detail when designing this cab. This is the place where harvesting technology works for you. Superb instrumentation: info-view monitor, multi-control lever, electro-hydraulic controls, all increase harvesting efficiency. Large areas of curved glass provide an excellent panoramic view. With the noise level of 76dBA, this must be the quietest cab in the industry.

All TX models now come with emissionized engines in line with emission norms set out by the authorities.

Task 94

Read Text 20 using a dictionary to name the main features of New Holland TX Combines.

Task 95

Look through Texts 21 A, B, C, D, E, and say why they

Task 92

Make a precis on the subject "Case IH rotary (Axial-Flow) combines" (Texts 18-19). Do it both in English and in Russian.

Write down the two variants.

Task 93

Read the title of Text 20 and say what machines are described in it.

Text 20

NEW HOLLAND TX COMBINES

Take a close look at the TX Combines. You will appreciate that New Holland leadership in combine design is fully reflected in the complete range. Capacity, comfort and convenience features work together to make these combines the most productive in the industry. Starting upfront with the high – capacity headers. Total header control at the operator's fingertips. Auto-float automates the lateral floatation system and the header height control system. Efficient separation systems work to increase your productivity. Total separation area of up to 7.72 square metres offers superb separation capacity.

For sloping terrain, each of the models is offered with the unique New Holland self-levelling cleaning shoe. This lets the operator maintain full operating capacity on slopes up to 17%. For harvesting at full capacity on float fields, the TX combines are available with a fixed cleaning shoe.

6. **Working and auxiliary equipment** by means of which the tractor power is applied to perform different jobs, include the following: PTO, pulleys, trailing and mounted implements and so on.

Tractors are constructed with hundreds of parts. The smaller parts are built into major assemblies such as tractor chassis, engine, transmission, driving axles, brakes, steering system and hydraulic system.

Task 8

Write out all the terms to describe the main components of the tractor. Memorize them.

Task 9

Describe the main components of the tractor.

Task 10

Write a summary of Text 2 in English.

START OF THE POWER FARMING REVOLUTION

Tractor power has revolutionized farming methods. When the first tractors trundled off on threshing tours in the American Mid-West in the early 1890s, however, they were crude and unreliable. There was little evidence they would ever offer serious competition to the steam engine. Steam reigned supreme for another 20 years or so before tractors took the lead in the power farming revolution.

Task 11

Look through Text 3 to answer these questions:

1. Where did the evolution of the tractor begin?
2. Who built the first tractor?

3. What other names of tractor pioneers are mentioned in the text? Which of these names are quite known to you?

Text 3

EVOLUTION OF THE TRACTOR

While it was in Britain that the first steam engines were developed, the evolution of the tractor began in the United States and later spread to Europe. Credit for building the first tractor is given to John Charter of the Charter Gasoline Engine Co. based on at Sterling Illinois. In 1889, Charter mounted a big, single-cylinder petrol or gasoline engine made by his company on the wheels of a Rumely traction engine.

The tractor was taken to farms near Madison, South Dakota, where it was used to drive a pulley belt powering a threshing machine. The performance of the tractor must have been satisfactory because Charter's company received orders to supply a further five or six tractors to farmers or contractors in the same area.

Competition for the Charter arrived in 1892 when at least three more experimental or pre-production tractors came onto the scene, all designed for threshing work and all built on the running gear of steam traction engines, with a slow- revving petrol engine to provide the power. Traction engine wheels and drive gears provided a readily available base for the engine, and it was a logical starting point for the early tractor pioneers.

One of the 1892 arrivals was the Capital tractor made by the Dissinger brothers from Wrightsville, Pennsylvania. They used an engine built under licence from the Otto company in Germany to power their tractor, which was designed for threshing. Little more was heard of the brother's first tractor venture, but the Dissinger family returned to the tractor market a few years later with a new Capital tractor which proved popular in the early 1900s. A more significant name in the list of tractor pioneers in 1892 was the J.I.Case Threshing Machine Co. It mounted a twin-

Grain Quality. With this design, concaves can be operated in a more relaxed setting for improved grain quality in all crops.

Crop Adaptability. By matching concaves, grate and rotor configurations, the Axial-Flow design can be adapted to a wider variety of crops and conditions.

Matched Capacity. From header to spreader, careful engineering ensures that all combine components are closely matched in capacity for optimum performance.

Advanced Farming Systems (AFS) and other productivity enhancements can also be added to older Axial-Flow models.

Faster harvesting speeds usually result in higher crop loss from shattering. That's not the case with new 2015 pickup headers in belt-type or Rake-Up versions for Case IH 2300 and 2100 Series Axial-Flow combines. Built to match today's large – capacity combines, the new 2015 header is designed to make a clean sweep of your field to help you get more of your crop.

While both header types work well in all crop types and conditions, the 2015 belt-type header is ideal for windrowed grains. The belt-type header includes four rollers and two belts that engage the crop and gently fit it into the header.

The 2015 rake-Up header is unmatched in its picking ability. With its unique sideways sweeping motion and positive picking action, the 2015 rake-type header really proves its worth in hard-to-thresh conditions and specialty crops such as canola, lentils, grass seed, peas and beans.

The slower teeth speed and positive drive of the 2015 header lets it run at half of the RPM speed of other machines. This ensures a gentle picking movement to reduce shatter, shelling, and pod loss. This slower pick-up speed also picks up fewer stones. An exclusive spring wire hold-down and windguard prevent the swath from rolling ahead of the pickup and the positive drive doesn't slip in lodged or tangled crop. With a new 325 multi-crop header from Case IH, you can harvest a variety of crops with the same machine.

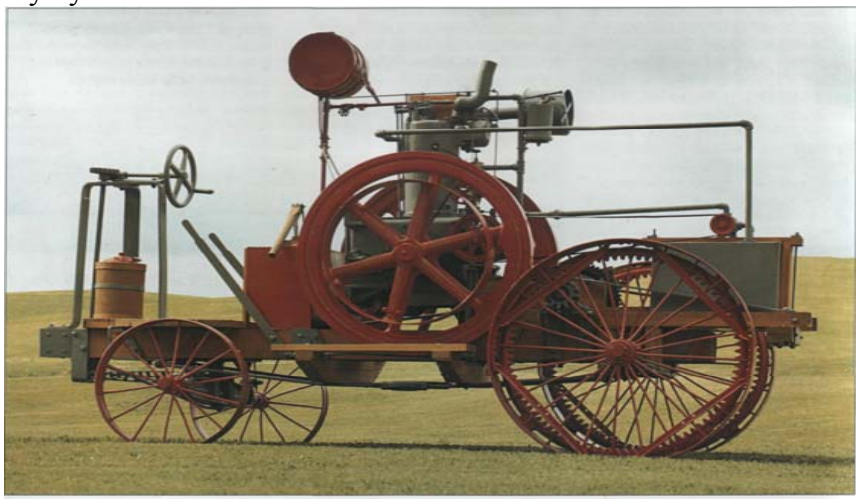
system. The Case IH 2300 Series combines are a direct descendant of this harvesting heritage. With billions of bushels as proof, the single in-line rotor threshes and separates grain more carefully and completely for higher yields.

Unlike conventional designs with up to 16 moving parts, the Axial-Flow rotor does the work of cylinders, concaves and straw walkers. Together with the patented Cross Flow fan system and 3-section concave, the rotary design gives you multiple-pass threshing for cleaner, high-quality grain. In fact, it puts bushels where they belong – in the grain tank – instead of sending them out of the back.

The proven rotary design of a 2300 series combine leads to a several significant advantages in simplicity, grain savings, grain quality, crop adaptability and performance… giving Axial-Flow owners the best investment. Simplicity. Case IH combines are designed with fewer moving parts for better reliability and easier serviceability.

Grain Savings. The multiple-pass threshing and separating system is more thorough which puts more grain in the tank.

put on a set of traction engine wheels and axles – made presumably by Case – and this was used as a test vehicle.



This is a replica of the tractor built by John Froelich in 1892.

Task 12

Read the text to find answers to these questions, you may use a dictionary:

1. What was the construction of the Charter?
2. What was the Charter used for?
3. What was a logical starting point for the early tractor pioneers?
4. Who made the Capital tractor?
5. What engine was used to power the Capital tractor? (While answering this question try to remember every thing you know about Dr.Otto).
6. How can you describe the first tractor built by J.I.Case Threshing Machine Co.?

Task 13

Find in the text the paragraph describing the application of the Charter. Translate it into Russian in writing.

Task 14

Write a summary of the text in English.

Task 15

Render Text 4 in Russian using no dictionary. Comment on its contents.

Text 4

A NEW TRACTOR COMPANY IS BORN

One more member of the group of tractor pioneers in 1892 was John Froelich, who lived in Froelich, Iowa, a small town named after his parents. In 1890, he bought a petrol engine from the Charter Gasoline Engine Co. to power the drill he used for his business, and it may have encouraged his idea to use a similar engine in a tractor.

John Froelich designed his tractor with the engine in the middle and a platform at the front for the driver. This gave a good forward view, which was a big improvement at that time. He took his tractor and a new Case threshing machine to South Dakota. The records he kept of this threshing tour show the equipment was working for 52.5 days, and during that time it threshed 62000 bushels of wheat and other small grains. No major breakdowns were reported, and enthusiastic reports of the tractors performance attracted the interest of a group of businessmen in Waterloo, Iowa. Froelich was invited to a meeting where it was agreed to form a new company in Waterloo to build tractors based on his design. The company was established in January 1893 and was called the Waterloo Gasoline Traction Engine Company. John Froelich's first tractor was a highly significant development. It was probably the first tractor to be equipped with reverse as well as forward

2. What can an operator control with the flip of a switch?
3. What does the right-hand console instrumentation include?
4. What is the left-hand console reserved for?
5. Where is the parking brake located?
6. What is the steering pedestal designed for?
7. How does the standard equipment Systems Monitor look like?

Task 86

Find in the text the paragraph describing the optional Grain Scan Monitor and translate it into Russian in writing.

Task 87

Title Text 18F.

Task 88

Write a summary of Text 18F in English.

Task 89

Think of a suitable title for Texts 18.

Task 90

Write a summary of Texts 18 in English.

Task 91

Render Text 19 in Russian using no dictionary. Comment on the contents of the text.

Text 19

AXIAL-FLOW COMBINES… STILL THE HARVESTING LEADER

Over the past three decades, Axial-Flow rotary combines have put more quality grain in the tank than any other harvesting

Task 79

Title Text 18D.

Task 80

Write a summary of Text 18D in English.

Task 81

Read 18E using a dictionary to find answers to these questions:

1. What do CI engineers call "human engineering"?
2. What can on operator see looking out the windows of a CI Axial-Flow Combine?
3. What do doors and windows of a combine have? What for?
4. Why does your ride seem more like the family car than a combine, if to speak about the Axial-Flow design?
5. What devices do standard features of a CI Axial-Flow Combine's Cab include?

Task 82

Find in the text the paragraph describing the standard seat in the Cab and translate it into Russian in writing.

Task 83

Title Text 18E.

Task 84

Write summary of Text 18E in English.

Task 85

Read Text 18 F using a dictionary to find answers to these questions:

1. What helps an operator to get complete command of all major combine functions?

tractor correctly to power the belt drive to a tractor.

Another reason why John Froelich's tractor is so important is that it was the original forerunner of the modern John Deere tractor range (Waterloo Bay range).

Task 16

Read the title of Text 5 and tell everything you know about John Deere.

Task 17

Read Text 5 to find answers to the questions that follow the text. You may use a dictionary.

Text 5

THE BEGINNINGS OF JOHN DEERE

The Waterloo Boy tractors that took Deere into the market were the R and N models. The model R was introduced in 1915, with the production continuing until 1919, and the Model N was available from 1917 until 1924. This means both Waterloo Boy models were the first tractors to be sold by Deere, even though they never carried the John Deere name. They also introduced Deere to the twin-cylinder horizontal engine layout that remained a successful feature of almost every John Deere production tractor for more than 40 years. Although at first glance the R and N models look similar, sharing as they do the same layout of engine, transmission and cooling system mounted as individual units on a steel girder frame, there were important differences. Design changes introduced on the Model N included a two-speed transmission instead of the single-speed version found on Model R. Also, while the big ring gears on the driving wheels of the Model N are almost the same diameter as the wheel itself, on the Model R version, these are little more than half the diameter of the wheel. The Model N radiator is mounted on the left-hand side of the frame, viewed from the driver's seat, but on most models Rs it is

on the right-hand side. The steering system is a less reliable indicator, as chain-link steering was fitted to all Model R tractors and to Model Ns built before about 1920, but this was replaced by more accurate worm and sector steering from 1920 onwards.

As well as being the first John Deere tractors, the Waterloo Boys possessed other claims to fame. One of the distributors of tractors exported to Britain, where they were sold under the Overtime brand name, was Harry Ferguson – the Overtime almost certainly triggered the early development of the Ferguson System of implement attachment and control.

1. What are the Models that took Deere into the market?
2. What feature remained a successful one of almost every John Deere production tractor fore more than 40 years?
3. What are the differences between the R and N models?
4. Why is the name "Harry Ferguson" mentioned in the text? What do you know about this person?

The Waterloo Boy tractors were not alone in retaining a steel-frame structure well into the 1920s.

optimum harvesting performance?

2. What is the function of the impeller on the front of the rotor? In what way does it work?
3. Why does an operator get better visibility and cleaner operation?

Task 74

Find in the text the paragraphs describing the processes performed by the impeller and translate them into Russian in writing.

Task 75

Title Text 18C.

Task 76

Write a summary of Text 18 C in English.

Task 77

Read Text 18D using a dictionary to find answers to these questions:

1. What are the parts which perform the separating process?
2. How many degrees of separating is the crop taken through?
3. Why is the crop getting far more opportunity to separate out in the Axial-Flow Combine than in a combine of conventional design?

Task 78

Find in the text the paragraphs describing the separating process in the Axial-Flow Combine and translate them into Russian in writing.

the Cross-Flow cleaning Fan and translate it into Russian in writing.

Task 67
Title Text 18 A.

Task 68
Write a summary of Text 18A in English.

Task 69
Read Text 18 B using a dictionary to find answers to these questions:

1. What was the innovation introduced by Case International engineers?
2. What is the main difference in threshing and separating in a conventional combine and in the Axial-Flow Combine?
3. Why is a single, in-lined mounted rotor featured by CI Axial-Flow Combine preferable?

Task 70
Find in the text the paragraphs describing the advantages of the rotor and translate them into Russian in writing.

Task 71
Title Text 18 B.

Task 72
Write a summary of Text 18B in English.

Task 73
Read Text 18C using a dictionary to find answers to these questions:

Task 18
Find in the text the paragraph describing the differences between the R and N models and translate it into Russian in writing.

Task 19
Write a summary of Text 5 in English.

Task 20
Read the title of Text 6 and say what it is about.

Task 21
Look through the first paragraph of the text and say when and where the first British tractor was designed and built.

Text 6

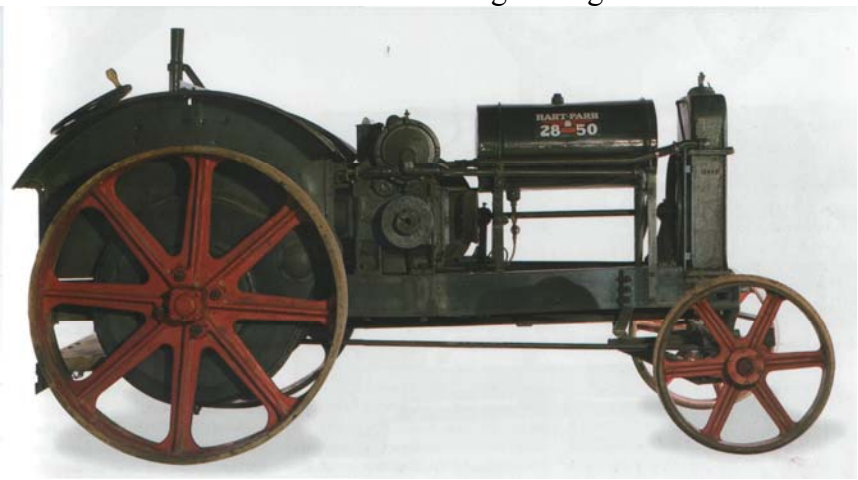
THE BIRTH OF BRITISH TRACTORS

Britain was the first European country to experiment with tractor power, and the first tractor to be built commercially in Britain arrived in 1896. It was designed and built by Richard Hornsby and Sons of Grantham, Lincolnshire, and its full official name was the Hornsby-Akroyd Patent Safety Oil Traction Engine. The makers promised four versions of the tractor powered by engines with 16, 20, 25 and 32 HP output, but it is unlikely that all of these were built. The engine was a semi-diesel based on a Stuart and Binney design, built by Hornsby under a licence agreement. They layout was horizontal, and it was started by using a blow lamp and ran on paraffin with the power delivered through a transmission with three forward gears and one reverse.

Although the Hornsby tractor was designed like a traction engine for stationary work it was also suitable for heavy haulage job on farms or on public roads, as indicated by the extremely long chassis and three-speed gearbox.

Steam engine comparisons were also prominent in a description of the tractor published in 1886 in a leading journal, **Implement and Machinery Review.**

"The driver has a good deal easier time of it than in the case of a steam engine", said the **Implement and Machinery Review's** report: "there is no fire to be frequently stoked, nor are there any water or steam gauges to be kept under supervision. Indeed, the duties are so comparatively light that one man can easily undertake the driving without any assistance, which, of course, means a considerable saving on the user". Another feature praised in the report was the fact that the engine's exhaust system had been "rendered silent" to avoid frightening horses.



Two 24HP engines were mounted side by side to produce the new 28-50 model.

Task 22

Read Text 6 to find answers to these questions, you may use a dictionary:

1. What was the engine of the Hornsby tractor?

chopper, straw spreader, feeder and rotary air screen.

The optional Grain Scan Monitor helps Axial-Flow Combines operate at the highest possible efficiency in a variety of crops and conditions. As grain and crop residue pass through the rotor or leave the chaffer, electronic sensors distinguish grain from residue and the monitor digitally displays the rate of loss. If the rate of loss becomes unacceptably high, you can make adjustments to reduce losses.

Task 65

Read Text 18 A using a dictionary to find answers to these questions:

1. What is the Cross Flow Cleaning Fan?
2. What are advantages of the Cross Flow Cleaning Fan?
3. What is the exclusive Axial-Flow rotor known for?

Task 66

Find in the text the paragraph describing the design of

height and sensitivity, header and feeder engaging and disengaging, separator engaging and disengaging, rotor speed, and cleaning fan speed. Right hand console instrumentation includes oil pressure, fuel, coolant temperature and alternator gauges. And with simple sealed touch pads, you instantly and accurately view digital readouts of rotor RPM, engine RPM, fan RPM and ground speed.

The left hand console is reserved for less frequently accessed controls such as the main transmission gearshift. Select the general speed range for your crop and conditions, then control the combine with the right-hand hydrostatic lever. The three transmission ranges provide overlap… so you are always able to maximize field operation.

The parking brake is also located on the left-hand console.

On the steering pedestal are turn signals and an unloading-tube swing control with a position indicator light. An optional grain tank full warning, with visual and audible alarm, is also displayed on the steering console.

On the right-hand side of the steering pedestal, right and left brake pedals can be applied separately or locked together for straight line stop.

To allow you to quickly monitor the operating status of your Axial-Flow Combine, we've supplied you with an array of very friendly, very visible instruments.

Two monitors provide you with the information you need to fine tune the performance of your Axial-Flow Combine.

The standard equipment Systems Monitor is a simple, solid-state instrument mounted in the cab headliner that constantly keeps track of the shaft speeds of nine combine components. It any of these shaft speeds slow to 70 percent of its normal speed the monitor will give you an audible and visible warning so you can shut down to check out the problem.

Shaft speeds monitored include the clean grain elevator, tailings elevator, cleaning fan, rotor, shoe sieve, beater or straw chopper, straw spreader, feeder and rotary air screen.

2. What was the Hornsby tractor suitable for?
3. What are the advantages of the Hornsby tractor?

Task 23

Find in the text the paragraph describing the easiness of driving the Hornsby tractor and translate it into Russian in writing.

Task 24

Write a summary of the text in English.

Task 25

Render Text 7 in Russian using no dictionary. Comment on its contents. Title the text.

Text 7

Although the United States and Britain dominated the early stages of tractor development, there was some activity elsewhere in Europe. Nicholas Cugnot, a French farmer's son, is credited with building the first self-propelled vehicle, using steam power, almost 250 years ago, while Otto built the first successful internal combustion engine in Germany. The French and the Germans used their early leadership, however, to develop motor cars instead of tractors.

A tractor designed and built by a Frenchman called Gougis in about 1907 included a power take-off shaft to power-trailed machines. Gougis successfully demonstrated the drive shaft with a binder, but the idea did not become widely available until the early 1920s.

German interest was concentrated initially on using electricity to power field work such as ploughing, but one exception to this was the ploughing tractor **Pfluglokomotive** designed by Deutz, a company as old as the four-stroke engine. Deutz built two different ploughing tractors in 1907, and one of these appears to have been the first two-way or bi-directional

Although the Deutz tractor and ploughing system showed considerable ingenuity, it failed to develop commercially. The Deutz company later became known as Deutz-Fahr, for many years Germany's biggest Tractor and machinery manufacturer. It was later taken over by the Italian-based Same tractor company, now called same Deuts-Fahr.

Task 26

Read the following information and say:

a) what tractor is spoken about in Text 8;
b) what the origin of the name "Fordson" is;
c) what the main features of this model are;
d) if you have ever heard about Fordsons?

Fordson Model F
Manufacturer: Henry Ford & Son Model: Fordson Model F Production started: 1917 Power Unit: Four-cylinder liquid-cooled with 101.6*127 mm (4*5 in)cylinders Power output: 20 HP Transmission: Fully enclosed gearbox with three forward gears and one reverse.

Task 27

Look through Text 8 and title it.

Text 8

It was Henry Ford's childhood on the family farm in Michigan that sparked his interest in tractor development, and the result was the spectacularly successful Fordson Model F.

Henry Ford and the model F had an enormous influence on

you're in command of a Case International Axial-Flow Combine.

The first time you climb in the cab and look around, you might call it downright plush. We call it "human engineering".

Take your eyes off the instruments for a while and look out of the windows. It's an unobstructed view to the header and to both sides. Rear view mirrors make backing and lining up with wagons and trucks simple, fast and confident. Reach, and the controls are where you expect. Comfortable. Confident.

Doors and windows have special seals to make them fit tight, keeping dirt, dust and most of the noise on the outside.

The Axial-Flow design itself goes a long way toward eliminating the vibration of earlier combines. What little vibration remains is smoothed out by exclusive Isomounts between the cab and the frame. And, padded floor mats and sound-absorbing acoustical material make your ride seem more like the family car than a combine.

Standard features include a heater and defroster, air-conditioning, 3-speed fan, tinted glass, windshield wiper, backlit instrumentation and function monitors.

The standard seat has mechanical suspension and adjusts to fit the way you sit. The optional deluxe air suspension seat features form fitting, molded construction plus on-the-go adjustments for the ultimate in working comfort. Both are designed to help keep you alert.

Text 18F

While Case International Axial-Flow Combines are built for the complex job of harvesting, using them is remarkably easy. Two conveniently positioned consoles put you in complete command of all major combine functions. To the right are header, separator and cleaning fan controls.

With the flip of a switch or the touch of a lever, you control reel height, header sensitivity, manual override of header

Text 18D

The separating process is where your profits can grow the most. With the older straw walker combines, and even some newer "rotary" designs, separating means an up-in-the-air race to the finish. But that kind of haste makes possible a lot of unnecessary waste. And that can be mighty hard to put up with, given the time and money you've already invested in the crop.

The Axial-Flow Combine makes sure you get the most from every plant on every acre.

Adjustable vanes spiral the crop through the separating area. There, separator bars on the rotor work with centrifugal force to separate the crop and pass it through grates on to the clearing system.

As the rotor separating bars revolve, they take the crop through a full 360 degrees of separating, yielding significantly more separation and grain recovery than in some straw walker and rotary combines.

For example, when the Model 1644 is harvesting corn, the rotor is spinning at about 500 rpm. It is hard to visualize, but at that speed-about 8 ½ revolutions each second – the crop is getting for more opportunity to separate out, with much more efficiency, than in a combine of conventional design. And that additional separating time makes a big difference in how many bushels go in the tank and how many go back on the ground.

Three separator grates in the rear half of the rotor cage area pass the separated grain to the cleaning system. Bar grates are recommended for corn, soybeans, rice and maize; slotted grates for edible beans and small grains; and solid grates for sunflower harvesting.

Text 18E

Hearing some people talk, it sounds like operating a combine is some form of cruel and unhuman punishment. That's why we've done our best to put your mind and body at ease when

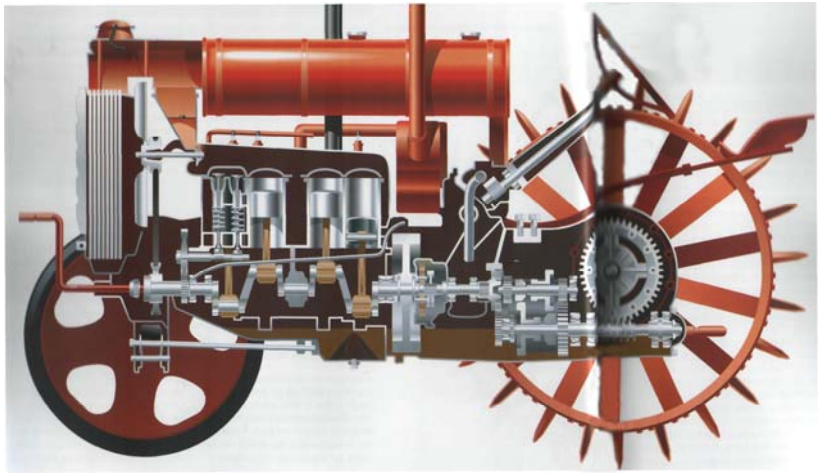
the tractor industry. The Model F was a basically good design which set many of the standards other tractor manufacturers were forced to follow. Henry Ford's mass-production techniques and his determination to sell the Model F at the lowest possible price made tractor power affordable to many thousands of farmers for the first time and, incidentally, forced many of his rival manufacturers out of business.

Henry Ford was a farmer's son who disliked the slow pace of working the land with horses. He is said to have expressed an interest in building tractors in about 1905, at a time when his car-manufacturing business was on the threshold of becoming one of the biggest success stories in commercial history.

British officials were aware of Henry Ford's new tractor development project, and this appeared to be exactly what was needed. A compact tractor would be ideal for the small fields, and a lightweight design would offer benefits on the heavy soils of many British farms.

Two of the pre-production tractors were shipped to Britain in April 1917 for testing, and the report was highly favourable. A British government request for tractor production to start as soon as possible soon followed, and on 8 October 1917, the first of the new Model F Fordsons rolled off the production line at the Ford factory in Dearborn.

After a slow start, production increased rapidly, and the British order for 6000 tractors was completed during the spring 1918. Production peaked at more than 100,000 in both 1923 and 1925, helped by massive orders from the Soviet Government, which depended heavily on American technology for an urgently needed farm mechanization programme. Soviet imports from Dearborn factory totalled 26,000 tractors, and thousands of Model F copies were built in the Krasny Putilowitz factory established in Russia with American and British equipment. In 1927, it was estimated that 85 percent of the tractors and trucks in the Soviet Union were either imported or locally built versions.



A sectioned view of a 1938 British-built Fordson Model N showing the worm and wormwheel final drive, the air cleaner, and the four-cylinder engine.

The last chapter in the development of the Model F and its descendants came in 1945, with the launch of the new Fordson E27N. There was the inevitable colour change, this time to dark blue, but the other improvements were more comprehensive. The new model was bigger and heavier than its predecessor, and the expensive, power-consuming worm and worm wheel final drive of the Model F were replaced.

Task 28

Read Text 8 to find answers to these questions, you may use a dictionary:

1. When did Henry Ford get interested in tractor development?
2. Why did tractor power become affordable to many thousands of farmers?

Axial-Flow Combine utilizes just one moving part – the rotor-and it simply does a better job.

Although the Axial-Flow Combine is built around the extraordinary performance strengths of the rotor, from header to straw spreader there are no weak links.

Text 18 C

A smooth flow of crop material is essential to optimum harvesting performance. That's why each Axial-Flow model features a feeder house specifically matched to the rotor's threshing and separating capacity. Conventional by most standards, this underslung chain and Slat conveyor delivers crop to a very unconventional threshing and separating system.

The first place you'll notice how a Case International Axial-Flow Combine is significantly different from conventional cylinder and concave designs, is where the feeder chain ends and the rotor begins.

The impeller on the front of the rotor firmly but gently draws the crop into the threshing cage. The countours and smooth edges of the impeller blades allow the crop to flow by, instead of being pulverized on impact as in many conventional combines.

The impeller, in conjunction with the cone, begins the crop spiraling towards the threshing area, allowing the crop to be introduced into the threshing area at about the same speed, thus reducing grain damage. In comparison, a conventional combine introduces the crop into the cylinder which is moving much faster than the crop, resulting in grain damage and the tell-tail dust which is often noticeable above the feeder area.

As the crop is drawn in, the spinning impeller creates a vacuum that draws a large volume of air up the feeder house and into the cage, dust along with it. Since the dust is literally pulled in at the front of the combine and passed through, you get better visibility in front, and altogether cleaner operation.

The Cross Flow Cleaning Fan may be the most significant advancement in this Axial-Flow series, but it is far from the only one. Power across the board has been increased by 20-25 h.p. (24-34 kw) versus previous models, and the difference can be felt in the higher crop throughput capacity and field speeds that you've been seeking.

In fact, customer input has resulted in a host of refinements and updates throughout this generation of Axial-Flow Combines. And of course, each model offers the exclusive Axial-Flow rotor – known for its gentle crop threshing and thorough grain separation.

Together, the rotor and Cross Flow cleaning enable the 1644, 1666 and 1688 Axial-Flow Combines to raise the industry standard. And better yet, they help these combines meet the toughest challenge of all: your high expectations.

Text 18 B

Millions of acres and billions of bushels ago, our engineers discovered a better way to harvest a crop. The innovation they introduced was a rotor that would soon revolutionize the combine industry, and send the competition spinning.

Conventional combines have long relied on a cylinder-and-concave threshing system. The crop is threshed quickly and aggressively. A lot of it is handled just fine, but the part that isn't, either gets damaged or tossed out the back of the combine. And that's not a very profitable end for a crop that took you so much to grow.

Case International Axial—Flow Combines feature a single, in-line mounted rotor that gets multiple chances to gently thresh your crop, and then separates it from straw, stalks, pods and other residue. So more of the crop gets harvested, with less damage.

Threshing and separating in a conventional combine takes as many as 16 moving parts. But threshing and separating in the

3. What country was the first to order Fordson Model F?
4. When did the production peak at more than 100,000? Why?
5. Why is the Krasny Putilowitz factory mentioned in the text?
6. What does the figure "85" mentioned in the sixth passage mean?
7. What happened in 1945?

Task 29

Find in the text the paragraph describing the rate of the Model F production growth and translate it into Russian in writing.

Task 30

Write a summary of the text in English.

Task 31

Look through the first passage of Text 9 and say if International Harvester produces only tractors.

Text 9

INTERNATIONAL HARVESTER

International Harvester was formed on 1902 when Deering and McCormic joined forces. In 1906, tractors were added to the highly successful range of general farm machinery and stationary engines; within five years, International Harvester had taken the lead as the largest farm equipment company of the world.

The tractor that played a crucial role in International's Success during the 1920s and 1930s was the Farmall, first available in 1924, with frameless construction replacing the traditional layout. The feature which brought well-deserved success to the Farmall was the fact that it was designed to meet the needs of rowcrop farmers. The new tractor was, of course, capable of doing other types of farm work as well-which is why the Farmall name

was appropriate-but it offered special advantages on farms where interrow jobs such as hoeing were important.

Other design features to attract rowcrop farmers included relatively light weight to minimize soil damage, plus a brake control for the steering which allowed the tractor to pivot on either of the rear wheels to make headland turns sharper. Later versions of the Farmall also provided a generous range of adjustment for the wheel spacing to suit different row width.

Farmall production started in 1924, using a four-cylinder IH engine delivering 18 HP at the belt pulley in its Nebraska test.

International Harvester's Farmall tractor

More Farmall models followed. The F 20 version, based on the previous model but with a 10 per cent increase in engine output to 20 HP, arrived in 1931, together with the 32 HP F30 Farmall. Another new model arrived in 1932, when the F12 was announced with a 16 HP engine, to be followed by the two-plough F14 Farmall in 1938. The success of the Farmall encouraged most of the leading US tractor makers into the rowcrop market. Deere's contribution was the GP or General Purpose tractor, Case offered

between these texts and Text 17.

Text 18 A

After years of building and refining the combine that has become the recognized standard in the industry, we realized we had created something else along the way: high expectations.

It's called the Cross Flow Cleaning Fan, and it ranks as one of the most significant advancements ever made in the cleaning system of a combine.

The Cross Flow Cleaning Fan utilizes a patented, chevron-patterned design that delivers an extremely uniform airflow across the entire sieve area, as opposed to the high-and low-pressure air pockets of other designs.

This innovation not only provides far better grain cleaning, but also reduces horsepower requirements and noise. With the Cross Flow, the total cleaning system adapts to changes in crop and conditions, with less need for adjustments.

In addition, the chaffer and shoe sieves in the 1644 and 1666 have been substantially enlarged to complement the fan's high performance.

The rotary (axial-flow) system of grain separation has several advantages over the more conventional method of grain separation. The first and the main one is higher output (20-30 per cent more than a comparable conventional harvester). Second, the design involves fewer moving parts. Consequently serving is said to be easier and less costly. The operator's cab is equipped with facilities for ventilation. The seat is adjustable. Servicing this combine is a relatively easy task.

Task 61

Read Text 17 using a dictionary to find answers to these questions:

1. What method of grain separation do rotary combine harvesters incorporate?
2. In what way does the crop in the combine move?
3. What does the rotor speed depend on?
4. What are the functions of the augers?
5. What are the advantages of the axial-flow system of grain separation?
6. Can you say that the text describes a conventional combine? Give your reasons.

Task 62

Find in the text the paragraph describing the advantages of the rotary system of grain separation and translate it into Russian in writing.

Task 63

Write a summary of the text and comment on its information in English.

Task 64

Look through Texts 18 A, B, C, D, E, F and say why the are numbered by the same figure and what is in common be-

a special rowcrop version of its model C, Huber introduced the LC, and Minneapolis-Moline designed its Twin City Universal Model for rowcrops.

Task 32

Read Text 9 to find answers to these questions, you may use a dictionary:

1. When did IH take the lead as the largest farm equipment company of the world? Why?
2. What is the Farmall? What feature brought the Farmall success?
3. What other design feature of the Farmall attracted rowcrop farmers?
4. When did Farmall production start?
5. What were some other Farmall models?
6. What was Deere's contribution to the rowcrop maket?

Task 33

Find in Text 9 the paragraph describing the feature which brought the Farmall well-deserved success and translate it into Russian in writing.

Task 34

Write a summary of the text in English.

Task 35

Read the title of Text 10 and tell everything you have learnt about John Deere from the previous texts.

Task 36

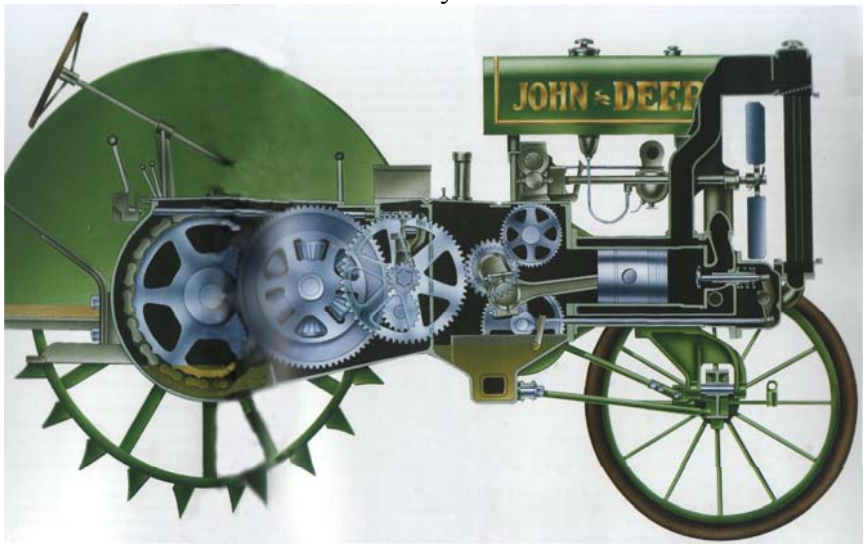
Read Text 10 to find answers to the questions that follow the text. You may use a dictionary.

Text 10

JOHN DEERE

Another US company that survived the 1920s Fordson competition was Deere Co. It continued to sell the Waterloo Boy Model N during the early 1920s, while it worked on a replacement tractor to be sold under the John Deere Brand name. The Model D was announced in 1923.

The Model D was lighter, more compact and more maneuverable than its predecessor. It provided more power, and it was based a more up-to-date frameless design with enclosed gear drives, but one important design feature inherited from the Waterloo Boy tractors was the twin-cylinder horizontal engine. In fact, the engine on the Model D, and on virtually all other John Deere tractors produced until 1961, was the opposite way round. The cylinder head were at the front instead of at the rear, as they had been on the Waterloo Boy tractors-but it was still a big, slow revving two-cylinder engine, one that continued to be a feature of John Deere tractors for almost 40 years.



John Deere Model D

4. What is a grain auger in a combine?
5. What does the pocket separator do?
6. Can you say that the text describes a conventional combine harvester? Give you reasons.

Task 59

Write a summary of the text and comment on its information in Russian.

Task 60

Read the title of Text 17 and say what the main feature of the machine described in the text is.

Text 17

ROTARY COMBINE HARVESTER

All rotary combine harvester models incorporate the same method of grain separation. The crop is fed from the cross auger of the header to the central feed intake conveyor. As the crop reaches the top of the elevator it is drawn into the inclined rotor by an impeller at the front. This also has the effect of drawing in and reducing the level of feeder dust.

The crop passes around the rotor two or three times if it is dry and three or four times if it is wet, the number of passes being determined by the rotor speed. This is infinitely variable from 280 rpm to 1,260 rpm and controlled electronically from the cab. Extra slow speeds are used for fragile crops and high speeds for hard-to-thresh materials. Drive to the rotor is by V-belt through a two-speed gearbox, with belt tension automatically adjusted according to the load. Separation occurs as the crop passes first over a three-section concave and then over a three-section separating grate.

A series of four augers beneath the rotor collects the separated grain and transfers it to the opposed action adjustable cleaning sieve. Grain falling through the sieves is collected by a second horizontal auger and transferred to the grain tank.

described in it.

Text 16

GRAIN COMBINE HARVESTER

Grain combine harvester is a farm machine – usually operated by one man – which cuts the corn, then threshes out the grain and winnows it. The cleaned grain is gathered in the bin of the combine and then taken away by trucks.

In front of the combine there is a table which cuts down the stalks brought up to it by the reel which then again feeds them onto the central part of the table while the transporter catches them up and sends them off to the threshing unit. In the thresher the grain is threshed out of the stalks and next through the deck mounted under the threshing cylinder falls upon the bolter and thence passes to the screen.

The straw is fed on to the straw-walker. Here it is shaken to remove the left-over grain while the straw itself is gathered on a strawtacker. As to the grain, it is now freed from impurities by a current of air coming from the fan. Then it falls through the riddle and through the grain auger runs to the flight elevator which finally conveys it to the bunker or bin. After the grain is discharges from the bin it passes over to the pocket separator which classes the grain for different purposes: as seedstock, milling material, grist, etc. thence it goes to the bin and finally to the elevator.

Task 58

Read the text using a dictionary to find answers to these questions:

1. What is a grain combine harvester?
2. What is the function of the table in front of the combine?
3. What is the function of the reel, the transporter, the

History has shown that the choice of engine layout for the Model D was correct and the twin-cylinder design was probably an important factor in establishing Deere as one of the leading US tractor manufacturers, particularly during the 1920s and 1930s. The twin-cylinder engine was slower running and not as smooth as its rivals with four cylinders, but smoothness was not a big sales feature in the 1920s, and the two-cylinder engine offered other benefit that were more important.

It was a much more simple design with a reputation for long-term durability, and it was also easier to service and repair, an important advantage at a time when skilled mechanics were few and far between. Sales of the Model D had reached the 10,000 –per-year level by 1928, and more models were added to the range. The Model C, forerunner of the General Purpose rowcrop tractor, arrived in 1927, and production of the Model A started in 1934, followed by the Model B in 1935 – all with two-cylinder engines, of course.

1. What was one more company that survived 1920s Fordson competition?
2. Was the design of the Model D frameless?
3. What was the most important design feature of the Model D?
4. What was an important factor in establishing Deere as one of the leading US tractor manufacturers?
5. What were the advantages of the twin-cylinder engine used on the Model D?
6. What Models arrived in 1927, 1934 and 1935?

Task 37

Find in the text the paragraph describing the advantages of the twin-cylinder engine and translate it into Russian in writing.

Task 38

Write a summary of the text in English.

Task 39

Render Text 11 in Russian using no dictionary. Comment on its contents. Title the text.

Text 11

Four-wheel drive was not widely available in the 1920s and 1930s, and, for those who wanted extra pulling efficiency, a crawler tractor was the obvious option. Crawler tracks have always been the most effective way to convert engine power into drawbar pull, particularly in wet soil conditions. But tracks also offer other benefits, including a bigger contact area on the ground to spread the weight of the tractor and reduce the risk of surface ruts and compacted soil. The extra grip of the tracks also improves stability and safety when working on steep land.

Inventors were working on the idea of using tracks instead of wheels long before the first tractor was built. The first crawler-track patents in Britain can be traced back to 1770s, and several unsuccessful attempts were made to produce a steam-powered track-laying vehicle in the early nineteenth century.

The real pioneers of the track laying tractor were the Holt and Best companies in the United States and Richard Hornsby in England. David Roberts, chief engineer with the Hornsby company, developed a track system which worked reasonably well, and one of the Hornsby-Akroyd tractors was modified to run on the tracks in about 1904.

Task 40

Make a precis of Texts 3-11. Do it both in Russian and in English. Write it down.

Task 41

Read the titles of Texts 12-14 and say what the main

placement depth, equalizing gauge wheels work to maintain it… even as they "walk" smoothly over residue or clods. Plus, the gauge wheels are pulled-not pushed like other types of planters. The pulled design helps stabilize the row unit, especially important at faster speeds in adverse field conditions.

Seed-to-soil contact. Early Riser planters use a four-step process to open and then close the seed trench. Double-disk openers are slightly offset to slice through residue and hard soil. Next, gauge wheels retain newly uncovered, moist soil next to the trench for its eventual return. The furrow firming point then forms and defines the seed trench into a clean "V" shape. Next, the patented-design covering disks return the moist soil to the trench as they close the trench from both sides, leaving the seed's position undisturbed.

Uniform soil pressure. The closing touch: a chevron-tread press wheel lightly firms the soil on top of the furrow as it eliminates air pockets, maximizing seed-to-soil contract. Its trademark pattern aids germination in crust-prone soils by creating a fracture zone above the seed.

Task 55

Make a precis on the subject "Seeding and Planting Machinery" (Texts 12-15). Do it both in English and in Russian. Write down the two variants.

Task 56

Make a precis on the subject "Cultivating, Seeding and Planting Machinery" (Texts 2-15). Do it both in English and in Russian. Write down the two variants.

HARVESTING MACHINERY

Task 57

Read the title of Text 16 and say what machine is de-

and soybeans to cotton and sorghum.

Population control. An early Riser planter offers 127 different population settings for fine-tuning your seeding rate. Once you have fine-tuned your system, you will have the most accurate metering system in the industry.

In-row seed spacing. The Cyclo Air module meters seed one-by-one on the drum on its way through an individual seed tube to the Early Riser row unit.

Plant to moisture. Zero-indexed depth control gives you the assurance that once you've arrived at the proper depth setting on one row, you've found the correct setting for all other rows. Here's why: the depth mechanism for all rows is carefully indexed at the factory. That's why you can trust your setting for one row as applying to all. This Case IH exclusive is just one of the reasons you can save up to 70% of the normal adjustment time required for other planters.

Uniform depth control. Once you've set the seed-

idea of these texts is.

Task 42

Read the first paragraph of Text 12 and name the development that has made a major contribution to tractor performance and is featured on virtually every modern tractor.

Text 12

DIESEL POWER

Another important technical development in the 30-year period from about 1920 was the development of diesel-powered tractors. This is another example of a development that has made a major contribution to tractor performance and is featured on virtually every modern tractor.

Diesel tractor development began in Europe and the first company to offer a tractor with a diesel engine was Benz of Mannheim, in Germany. Benz began experimenting with diesel power after World War I had ended, and small-scale production started in 1921 or 1922. The engine was a twin-cylinder design, used initially in a small truck; in 1923, the same type of engine was offered as an option for the Benz-Sendling motor plough. This was a strange contraption with a single driving wheel at the rear. It had been available since 1919 with a petrol engine, but the 1923 version had the distinction of almost certainly being the world's first diesel-powered tractor.

The Benz range of diesel engines also included a singe-cylinder version with hopper cooling, and, a four-cylinder diesel arrived in 1923 to be used as a truck engine. All the early Benz engines were designed with a pre-combustion chamber, a feature first patented in 1909 and developed to improve combustion efficiency. In 1926, the Daimler and Benz companies, named after the two earliest pioneers of the car industry, merged to form Daimler-Benz, now known as Daimler-Chrysler. The Benz name survived in Mercedes-Benz, one of the world's most prestigious

five years after the merge; these were exported to a long list of countries, including Australia and Britain.

Britain's first commercially successful diesel tractor was the Field Marshall, powered by a slow-revving, single-cylinder engine with a distinctive exhaust note.

Task 43

Read Text 12 to find answers to these questions, you may use a dictionary:

1. What does the term "diesel-powered tractor" mean?
2. What was the first company to offer a tractor with a diesel-engine?
3. When did the production of diesel-powered tractors begin?
4. What were the constructions of the Benz range of diesel engines?

Task 50

Read Text 14 using a dictionary to find answers to these questions:

1. What does the new Case SDX30 pair?
2. What is the new SDX30 designed for?
3. What does the massive frame of the drill provide?
4. What does the drill feature?
5. What does the new wear-resistant steel scraper provide?
6. Can the SDX30 be tailored to meet one's specific needs in certain crops and conditions?
7. What can one do to allow for convenient road transport and field entry?

Task 51

Find in the text the paragraphs describing the drill's frame and the advanced single-disk opener design and translate them into Russian in writing.

Task 52

Title Text 14.

Task 53

Write a summary of Text 14 in English.

Task 54

Render Text 15 in Russian using no dictionary. Comment on the contents of the text.

Text 15

THE GOAL: EVERY SEED A GERMINATED SEED

And an Early Riser row unit is designed to return on this goal, year after year, in conventional-till to no-till, and from corn

Finally, a packer wheel closes the furrow walls to eliminate air pockets and encourage fast, uniform emergence.

It's easy to tailor the SDX30 to meet your specific needs in certain crops and conditions. For industry-first flexibility, you can adjust the down-pressure to each rank separately for optimum depth control, or completely lock up a rank to change row spacing and configuration.

Set seeding depth and opener down-force easily and safely without tools. You can also adjust the closing wheel's location and packing pressure for added flexibility in seeding a variety of crops.

For nonstop no-till productivity, the new SDX30 from Case IH covers 30ft. (9.1 m) per pass on 7.5-or 10 in. (19 or 25 cm) spacing, yet folds to allow for convenient road transport and field entry.

5. Can you name one of the world's most prestigious marques? Do it.

Task 44

Find in the text the paragraph describing the Benz range of diesel engines and translate it into Russian in writing.

Task 45

Write a summary of the text in English.

Task 46

Look through Text 13 and name all the US tractor manufacturers to offer diesel power mentioned in this text.

Text 13

DIESEL IN NORTH AMERICA

Caterpillar was the first US tractor manufacturer to offer diesel power. The first experimental diesel engines were converted petrol units, but the field testing with a specially designed Caterpillar diesel engine started in 1930 with a diesel version of the Sixty model. The production version of the Diesel Sixty arrived in 1931, and it set a new fuel efficiency record when consumption was measured independently in the brake horse test at Nebraska. The efficiency figure was 3.05 horsepower hours per litre (13.87 horsepower hours per gallon) of fuel, and the four-cylinder I-head Caterpillar engine had a 700 rpm rated speed and produced a maximum of 77.08 HP.

More diesel models were added to the Caterpillar range during the 1930s, starting with Diesel Thirty-Five, Fifty and Seventy-Five models announced in 1932. Some of the diesel tractors were identified with a model number starting with the letters RD chosen as a tribute to Rudolf Diesel, who invented the engines that bear his name.

Caterpillar more than any other company, established the

success of diesel power for farm tractors, and the company deserves great credit for recognizing the potential advantages of diesel power for tractors and for producing such a successful series of engines. During the 1930s and for almost 20 years following the launch of the Diesel 60, Caterpillar was easily the world's biggest and most successful manufacturer of diesel tractors.

The success of the Cat diesels forced other crawler tractor manufacturers in the United States to follow their example. The Trac Trac Tor T-40 was the first model in International Harvester's McCormic-Deering range with a diesel engine. The four-cylinder I-head engine with 120.7 mm (4,75 in) bore and 165.1 mm (6,5 in) stroke developed its rated power at 1100 rpm, and it set a new record for fuel efficiency when it achieved 15.18 horsepower hours per gallon in the belt test at Nebraska in 1935. International Harvester followed this with the WD-40 diesel model, probably the first US-wheeled tractor with diesel power. It was available from 1934, producing slightly less than 50 HP.

Cleveland Tractor Co.'s first diesel tracklayer in their Cletrac range was the 40 Diesel, announced in 1934 and powered by a Hercules I-head engine with six cylinders. The rated output was 57 HP. The first diesel model from Allis-Chalmers was the WK-O crawler tractor, tested at Nebraska in 1937.

It was the system chosen by John Deere when it introduced its first diesel, the Model R, announced in 1948 and produced for six years from 1949. For the production, the design team remained loyal to the two-cylinder horizontal engine layout that had powered virtually all previous John Deere tractors. The new diesel was a big engine with 146*203 mm (5.75*8 in) bore and stroke, and maximum power output was 51 HP, making the Model R the most powerful production tractor John Deere had built. It was also the most economical, setting yet another record for fuel efficiency at Nebraska.

The petrol engine for starting the big diesel was also a two-cylinder design, but in this case the cylinders were horizontally

Air Systems are.

Task 47

Find in the text the paragraphs describing the Cyclo Air metering modules and translate them into Russian in writing.

Task 48

Write a summary of Text 13 in English.

Task 49

Look through Text 14 and say what machine is described in it.

Text 14

The new Case IH SDX30 no-till air drill pairs advanced seeding performance with penetrating power for nonstop productivity in no-till fields.

This low-disturbance, single-disk seeding machine is built specifically to handle the tough conditions of direct seeding. A massive frame provides the strength and weight needed for dependable high-speed operation in hard soils and heavy residue. And with a full 61 in. (155 cm) between ranks, the SDX30 leaves extra room for residue flow to reduce the chance of plugging.

The new SDX30 features an advanced single-disk opener design with just five key components for longer life and reliability. Leading the way is the industry's largest disk which slices through debris and carves a crisp, clean furrow. The low 5°angle of this disk works in tandem with the proven Early Riser gauge wheel to reduce sidewall compaction.

Opener blades stay clean thanks to a new wear-resistant steel scraper, which also acts as a seed boot by helping from the furrow. For maximum seed-to-soil contact, a smooth-surfaced seed lock wheel gently firms seed into the bottom of the furrow.

The Cyclo Air metering modules coupled with the row-crop opener give you accurate seed spacing and uniform depth control with excellent seed-to-soil contact for all crop types and field conditions.

Patterned after the field-proven Case IH Early Riser row unit, a shank-style opener lifts soil out of the furrow. Then a firming point gently creates and firms the furrow walls without causing sidewall compaction.

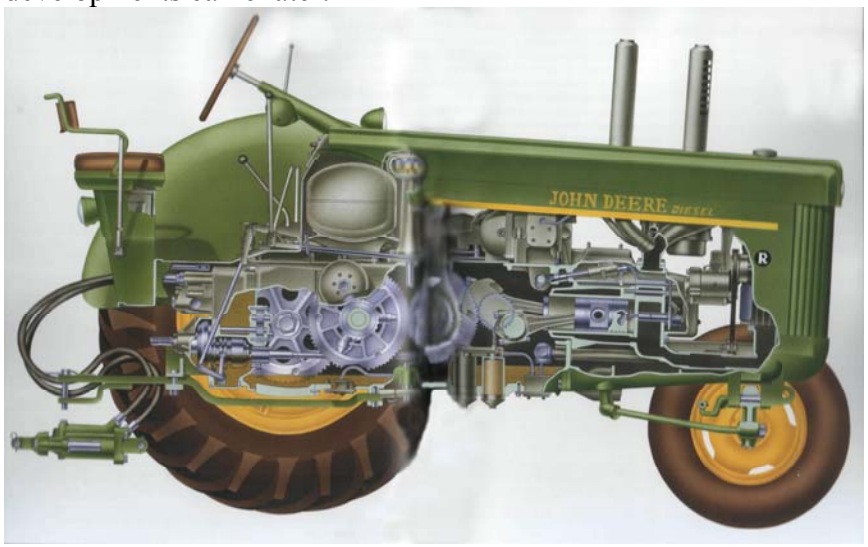
Each Cyclo Air module serves seed for up to eight rows. The hydraulically driven fan pressurizes the rotating seed drum to deliver metered seed to the openers. A hydraulic meter drive ensures smooth drum rotation for more accurate seed spacing. You can adjust population rates on-the-go with the touch of a switch in the cab. The Early Rizer monitor with easy-to-read LCD display lets you keep an eye on seed flow.

As with any of the big-capacity Concord air systems, you'll make fewer refill stops to help you cover more acres in a day. Choose from 110-to 350-bushel capacities for higher productivity. Save a trip across your fields by applying dry, liquid or starter fertilizer at the same time.

Task 46

Read the text using a dictionary and say what Concord

opposed, rather than parallel. The petrol engine was water-cooled and shared the same cooling system as the big diesel, allowing the heat produced by the petrol engine to warm up the cooling system and make the diesel engine easier to start on cold mornings. An electric starter motor was provided for the petrol engine, powered by a battery, and another starting system – this time manually operated by lever-was included as a back-up if the battery was flat. The cold start problem for diesel tractors would eventually be solved by improvements in the combustion chamber design, when electric heating elements were added to warm the cylinders and easily combustible gases were injected into the chamber, but these developments came later.



John Deere's first production tractor with diesel power was the Model R.

Task 47

Read Text 13 to find answers to these questions, you

may use a dictionary:

1. What US tractor manufacturer was the first to offer Diesel power?
2. What was the efficiency figure of the Diesel Sixty?
3. What diesel models were added to the Caterpillar range during the 1930s?
4. What was the first US wheeled tractor with diesel power?
5. What was the first diesel tracklayer produced by Cleveland Tractor Co?
6. Can you describe the Model R – the most powerful production tractor John Deere had built? Do it.
7. What is the most serious problems for diesel tractors? When and how was this problem solved?

Task 48

Find in the text the paragraph describing the petrol engine that was used for starting the big diesel and translate it into Russian in writing.

Task 49

Write a summary of Text 13 in English.

Task 50

Translate the title of Text 14. Look through the first paragraph of the text and say what British company was the first to develop diesel-powered tractors.

Text 14

BRITAIN'S ENTRY INTO DIESEL

British interest in diesel power for tractors started in about 1928. That was when the Marshall company began its development work on what later became Britain's first commercially successful diesel engine when it was used to power the Field Marshall

Task 44

Read Text 12 using a dictionary and write a summary of the text in Russian.

Task 45

Look through the first paragraph of Text 13 and say in what way one can get a versatile all-crop seeding tool for both cereal grains and row crops.

Text 13

AN ALL-NEW COMBINATION FOR ALL-CROP VERSATILITY

What happens when you combine the productivity multiple-product delivery of a Concord air till drill with the accuracy of the Case IH Cyclo Air Seed meter? You get a versatile all-crop seeding tool for both cereal grains and row crops to give you maximum value from a single investment.

Get the ultimate in crop rotation flexibility with the new Case IH Cyclo Air Metering System for Concord air systems. Now you can easily add row crops to your cereal grains rotation without buying an entirely new piece of planting equipment. Plant corn, milo, seen-flowers or soybeans with a Concord air till drill equipped with the Cyclo Air Meter attachment.

Proven on millions of acres, Case IH 955 Series Early Riser planters feature the reliable row unit design that gives seeds a Precision-Controlled Environment to encourage faster germination and uniform emergence. With its large-capacity central-fill seed hopper, the popular Cyclo Air System offers higher productivity without sacrificing precision metering.

Discover true seed singulation with Case IH 1200 Series planters. These models deliver outstanding in-row accuracy thanks to the Advanced Seed Meter. This vacuum-type design ensures consistent seed spacing and accurate population control or higher ground speeds.

For acre-eating productivity and accurate placement check out Case IH Concord air drills. The reliable "ribbon seeding" and superior packing system of a Case IH Concord air till drill offer better yield potential from every acre. Save time and trips across your acres with bulk handling and multiple-product delivery for higher productivity. New additions for row-crop capability include an all new single-disk no-till air drill for low-disturbance seeding.

Now you can take control of inputs for maximum yields and a better bottom line with Case IH Advanced Farming Systems (AFS) seeding equipment.

Case IH offers AFS planters and Concord air systems for variable-rate control of seed, fertilizer and chemicals.

A simple in-cab monitor/controller lets you change rates manually as you wish, or automatically using prescription-based software. You can choose from two portable touchscreen displays to handle in-cab monitoring, variable-rate control and frame functions. The large AFS Universal Display Plus also features the added functionality of DYPS – referenced data for full-fledged precision farming.

series tractors. The engine was a true diesel, but it was based on the Lanz semi-diesel and inherited the Lanz engine's single-cylinder design.

G. & H. McLaren of Leeds was another company which by the late 1920s was firmly committed to diesel power, importing Mercedes-Benz tractors from Germany and also assembling the twin-cylinder version for sale under the McLaren name.

Maximum output from the two-cylinder vertical engine in the McLaren tractor was 30.5 HP, and the rated engine speed was 800 rpm. The bore and stroke figures were 134.6 mm (5.3 in) 200.7 mm (7.9 in), and the engine was started by using a blowlamp.

Another British company with faith in the future of diesel-powered tractors was Agricultural and General Engineers (AGE). One of the AGE tractors was powered by a four-cylinder Blackstone engine. The rated speed of the engine was 1000 rpm, and a petrol engine was provided for starting the diesel. The Blackstone engine powered a tractor made by Garett, an AGE member with a prestigious history based on steam engine power.

The other diesel engine from the AGE was made by Aveling and Porter of Rochester, Kent. It was also a four-cylinder design. The engine, called the Invicta, had an 1150 rpm rated speed, making it one of the fastest of the early generation of tractor diesels.

The Marshall diesel, the Mercedes and McLaren models and the two AGE tractors all took part in the 1930s World Agricultural Tractor Trials held near Wallingford, Oxfordshire. This was one of the biggest events of its kind ever held, organized jointly by the Oxford University's Institute of Agricultural Engineering and the Royal Agricultural Society of England.

Task 51

Read Text 14 to find answers to these questions, you may use a dictionary:

1. What kind of engine powered the Field Marshall?
2. What were the characteristics of the engine in the McLaren tractor?
3. What does “AGE” mean?
4. What were the two AGE models?
5. Why is the Oxford University mentioned in the text?

Task 52

Find in the text the paragraph describing the diesel engine made by Aveling and Porter and translate it into Russian in writing.

Task 53

Write a summary of the text in English.

Task 54

Make a precis on the subject “Diesel Power” (Texts 12-14). Do it both in Russian and in English. Write down the two versions.

Task 55

Render Text 15 in Russian using no dictionary. Comment on its contents. Title the text.

Text 15

Technical developments such as diesel power, rubber tyres and the three-point linkage with hydraulic control affected the performance of the tractor. They were the most significant improvements during the 30-year period from 1920, but this was also the period when styling became important.

The fact that appearances can influence customers’ buying decisions had already brought stylists to the fore in the motor industry, and tractor manufacturers followed the same trend just a few years later. Most of the major styling developments took place

Task 42

Make a precis on the subject "Cultivating Machinery" (Texts 2-11). Do it both in English and in Russian. Write down the two variants.

Task 43

Read the title of Text 12 and name the advanced seeding systems offered by Case IH.

Text 12

CASE IH OFFERS ADVANCED SEEDING SYSTEMS

To give seeds a head start in the first season of the new millennium, Case IH offers a full family of planters and Concord air drills. With more than 60 available models, you’re sure to find the best seeding solution for your operation. New advancements offer incredible versatility, high productivity, advanced technology and improved accuracy.

The PZ Crumbler was initially developed by farmer (and farm machinery designer) Mr. C.Stekette for the preparation of sugar beet seedbed. His idea was to create a tool for providing a uniformly fine, level seedbed with a constant depth to arrive at maximum germination.

Mr. Stekette came up with the idea of combining two crumbler rollers with two harrows: the crumblers behind the harrows. The harrows would be adjustable for depth independently of the rollers, and the four implements would run in line.

According to Mr.Appel who farms 45 ha farm in Baarland and who grows 16 ha potatoes, 12 ha sugar beet and 13 ha winter wheat, the crumbler's leveling action is another reason why the implement is so popular in Holland.

He says it takes him just 6 hr 10 to prepare a seedbed for his 14 ha of onions using a 3 m-wide ZK 3000 PZ Crumbler behind a 90 h.p. Ford 7000 tractor.

Normally, all seedbeds are prepared in a single pass of the crumbler, while plowing has been completed in the previous autumn. Four days before the crumbler is used to produce the potato seedbed.

Mr. Appel uses a single pass of a Dutch harrow to dry out the ground. In this case, the tines of the crumbler are set to work at 100 mm-120 mm depth to provide a slightly deeper tilth for the crop and it is worked at about 1.2 ha/hr behind the 90 h.p. Ford.

Cultivations for potatoes begin in the first half of April, and planting starts as soon as the crumbler is out of the field. "If we delay planting there is a real danger of rain destroying the surface structure of the soil; on our type of heavy clay this would mean carrying out all the cultivations for a second time," said Mr. Appel.

in the United States, and some of the biggest tractor manufacturers were prepared to pay big money to hire up industrial designers to give their products a new look.

Many leading tractor companies introduced new styling during the late 1920s and 1930s, with curves replacing the previous angular lines, and there was also a trend towards brighter, more eye-catching colours. Examples included the British-built Fordson Model N, which exchanged its dark blue paint finish for a conspicuous shade of orange as part of a major update in 1937. On more example is the special shade of red adopted in 1939 for Case tractors instead of the previous grey.

While US manufacturers led the way in the 1930s styling and colour changes, European manufacturers could not ignore the trend. The colour chosen in 1939 for David Brown's new tractor to replace the grey Harry Furguson preferred was a bright shade of red identified as "hunting pink", the very English name for the colour of a coats worn when fox-hunting. In 1965, this paint finish made way for a more distinctive white and brown colour scheme, or, as the company insisted, "orchid white" and "chocolate brown".

Task 56

Make a precis on the subject "Start of the power Farming Revolution". (Texts 3-15). Do it both in Russian and in English. Write down the two versions.

SHAPING THE MODERN TRACTOR

Driver comfort and safety, neglected for decades, are now important priorities. Safety cabs have been forced on the tractor industry by legislation which, coupled with cab suspension systems and sprung axles, has allowed faster, safer working speed. Other major developments include the introduction of rubber tracks, which have dramatically improved the performance of

crawler models, turbocharged engines and a new generation of easy-to-use CVT (Constantly Variable Transmission) drive systems.

Task 57

Read the title of Text 16 and say what driver safety and comfort mean, in your opinion.

Task 58

Look through Text 16 to find answers to these questions:

1. When did the first really serious attempt to make tractor driving a more comfortable occupation arrive?
2. How did Minneapolis – Moline call its new model?
3. Why does the Comforttractor deserve to be remembered?

Text 16

MAKING COMFORT A PRIORITY

The first really serious attempt to make tractor driving a more comfortable occupation arrived in 1938 when Minneapolis-Moline announced its new UDLX tractor - Minneapolis-Moline called it a "Comforttractor", and in the company's publicity it was billed as "the World's Greatest Tractor". It was described as a three-or four-plough tractors. Engineers at Minneapolis-Moline designed a steel cab with glazed windows and noise-absorbing insulation for the Comforttractor. It was the first tractor designed and built with an enclosed cab, although it was also available without a cab. Inside the Cab, the equipment list was more generous than that of many 1930s cars. It included a radio and a heater, plus a wiper and a defroster for the front window. There was an electric clock, a roof light and an illuminated instrument panel, and it was almost certainly the first farm tractor equipped with both a cigar lighter and a built-in ashtray.

plows?

Task 38

Find in the text the paragraph describing the angle of attack of the disk gang and translate it into Russian in writing.

Task 39

Write a summary of Text 10 in English.

Task 40

Translate the title of Text 11 using a dictionary.

Task 41

Render Text 11 in Russian using no dictionary. Comment on the contents of the text.

Text 11

THE PZ CRUMBLER

Shallow cultivation is recommended by two Dutch farmers for keeping cultivation costs at a reasonable level. Both live in the Boorland region in the South-West Holland; both recognize that it is not always necessary to use tackle such as a power harrow to make a deep tilth.

Indeed, they were quick to point out that such equipment which is expensive to buy and operate in Holland is very often used only for winter wheat (when the seedbed is too tough) and possibly for potatoes.

For smaller seeds, shallow cultivations are very much the order of the day and are performed with combination harrows such as the PZ Crumbler.

Many farmers in Holland have also found that this type of implement has a high work rate with operating speed of between 6 and 7 km/hr.

axle differentiates these tools from regular disk plows which have the disk blades tipped back, necessitating separate axles and bearings for each blade.

Disk tillers are made as small as two-blade models cutting 15 in. wide up to models cutting 20 ft. wide. They are highly economical of power. Seeding boxes are available for some models, enabling seedbed preparation and wheat seeding to be done in one operation.

The forces acting on a disk tiller are similar to those acting on a plow except that the resultant lengthwise soil force on the blades is usually upward, requiring extra weight for penetration.

Trail-type disk tillers usually permit the angle of attack of the disk gang to be adjusted from 40 to 55°. In hard high-draft soil, penetration can be improved and width of cut decreased by increasing the angle, while maximum width can be taken with less angle in loose easy-working soils. This adjustment is provided by changing the angle of the land wheel and the furrow wheels with respect to the disk gang.

Hitching principles are similar to those for moldboard plows. The center of the draft is at the center disk blade slightly below the surface of the ground.

Disk tillers are necessarily built heavier than moldboard plows and wheel weights can be added for penetration in hard soil.

Task 37

Read Text 10 using a dictionary to find answers to these questions:

1. What do disk tillers consist of?
2. What sizes can disk tillers have?
3. What is the economical characteristics of disk tillers?
4. What forces act on a disk tiller?
5. How can penetration of a disk tiller be improved?
6. What are hitching principles for a disk tiller?
7. Why are disk tillers built heavier than moldboard

With two upholstered seats in the cab and a top speed of 64 km/h (40 mph) on the road, the UDLX could spend the day ploughing and then provide suitable transport for a romantic trip to a restaurant or the movies in the evening. Safety terms included full road lighting equipment front and rear, a bumper for protection at the front plus energizing Bendix brakes, and there was safety glass in all the windows and a sun visor at the front. The transmission was a specially developed five-speed gearbox allowing on-the-move shifting, the power unit was the Minneapolis-Moline four cylinder petrol engine, and electric starting was included in the standard specification. A belt pulley was provided for stationary work “Just as the city man needs a comfortable closed car to pursue his activities, so the farmer who spends a big share of his time on a tractor needs and wants greater comfort on the job”, it was confidently asserted in the UDLX sales leaflet.

For well over half a century, the only concession to driver comfort on most tractors was a shaped metal seat mounted on a springy steel support. Tractor manufacturers and their customers share the blame for giving safety and comfort such a low priority.

There were, inevitably, some disadvantages, and one of these was the placement of the doors at the rear of the cab. Using the back doors did not encourage dignified entries and exists, particularly with equipment such as a wide cultivator hitched to the drawbar. Another problem was the price. In financial terms, the Comforttractor was almost certainly an expensive failure for Minneapolis-Moline, but it deserves to be remembered as a bold and imaginative attempt to offer tractor drivers significantly better standards of safety and comfort at least 40 years before the market was ready for such extravagance.

Task 59

Read Text 16 to find answers to some more questions, you may use a dictionary:

1. What did the equipment list of the Comforttractor include?
2. What did safety items include?
3. What was the power unit used in the UDLX?
4. What was confidently asserted in UDLX sales leaflet?
5. What were the disadvantages of the Comforttractor?

Task 60

Find in the text the paragraph describing the opportunities for a romantic trip on the Comforttractor and translate it into Russian in writing.

Task 61

Write a summary of the text in English.

Task 62

Look through Text 17 and say what system for tractor cabs it describes.

On the 6700 coulter chisel, coulters first cut residue down to size. Then two ranks of C-shanks fracture soil and uniformly mix residue with the critical top 2 to 5 inches (5 to 13 cm) of surface soil.

On the 6750 parabolic chisel, disks or coulters are followed by a middle rank of standard C-shanks. Heavy-duty parabolic shanks mounted on the rear rank relocate compacted soil 4 inches (10 cm) deeper than regular C-shanks. Parabolic shanks with winged tiger points open compacted soil and mix it with crop residue for a healthier, mellower root environment.

Task 36

Look through the first paragraph of Text 10 and say what disk tillers are designed for.

Text 10

DISK TILLERS

These tools are designed for both tillage and seeding. They consist of a single gang of disk blades, 20 to 26 in. in diameter, on a common axle, all throwing the soil the same way. The common

more.

Task 33

Read Text 8 using a dictionary and describe the row-crop cultivators in Russian.

Task 34

Title Text 8.

Task 35

Render Text 9 in Russian using no dictionary. Comment on the contents of the text.

Text 9

NEW CHISELS CONTROL RESIDUE AND TIGHT COMPACTION

For residue management and compaction control, Case IH offers you two cost-effective choices to meet today's conservation tillage requirements – the new 6700 coulter chisel and 6750 parabolic chisel. These versatile cutter/chisel plows manage and mix residue while fracturing compaction to create a better soil environment for your seedbed.

Text 17

In 1977, Renault Agriculture, the tractor division of the car and commercial vehicle company, had begun work on a cab suspension project; in the same year, engineers from Renault had visited the Britain's Silsoe Research Institute (SRI) to exchange ideas on how suspension systems could be designed.

Renault was also developing suspension systems for truck cabs, and the two research teams were able to work together. In spite of this advantage, it took 10 years to complete the development programme. The production version was called the Hydrostable cab, and it was announced at the SIMA machinery show in Paris in 1987 as standard equipment on Renault's high-specification TZ series tractors.

Renault engineers developed a combination of coil springs, anti-roll bars, shock absorbers and transverse rods to produce the suspension system for the Hydrostable cab. It is claimed to have at least some effect on all of the five types of movement tractor drivers are subjected to during their work. These are vertical movements from the tractor tyres, longitudinal movements caused mainly when trailed implements are towed at speed, lateral movements linked mainly to bigger tractors on large tyres, and pitching and rolling movements.

Although the new cab suspension attracted enthusiastic comments from some users and won a number of awards for innovations, including a gold medal from the Royal Agricultural Society of England sales remained disappointing at just. After eight years, only about 15 per cent of UK customers were specifying the Hydrostable cab on their new Renault tractors. Since then, however, demand has increased sharply; by 1999, almost 80 per cent of the Renault models sold in the United Kindom were equipped with the suspended cab. Sales have been helped by the results of a series of tests carried out in Germany in 1996. The tests showed that vibration levels on the tractors fitted with the Hydrostable cab

were reduced by up to 35 percent in some situations. Also, when driving over rough surfaces at high working speeds, it took up to twice as long for the driver in the Hydrostable cab to experience symptoms of stress. Since then, Renault has improved the Hydrostable suspension by providing an adjustment which enables the driver to alter its responsiveness, and it added a font-axle suspension option for some of its tractors in the year 2001.

Renault revolutionized driver comfort when it introduced cabs with a full suspension system in 1980s.

Task 63

Read the text to find answers to the questions below. You may use a dictionary. Title the text.

1. When did Renault begin work on a cab suspension system? Whom did they work with?
2. How was the production version of the suspension system called?

attachments and row crop makers to build a seedbed for spring planting.

The 2220 row-crop cultivator is perfect for large-acreage operations of corn, soybean and sugar-beet crops. The single shank design and low-profile sweep of the 2220 lets you travel at speeds above 7 mph (4.3 kph) to cover more acres in a day. Furthermore, you can customize the machine with a wide choice of sweeps and attachments for a variety of tasks in conventional to no-till fields.

Another popular cultivation choice is the 1830 row-crop cultivator, which is well-suited for a wide range of row crops and farming practices. Available with either three-or five-tool assemblies and your choice of shanks and shields, the 1830 provides excellent weed control and cultivation in conventional and medium residue conditions.

It is easy to adapt a Case IH row-crop cultivator to your specific needs with your choice of toolbars, frame configurations, coulters, shanks, shields, sweeps and other attachments such as a ridging wing, anhydrous knife adapter, barring off disks, and

Task 31

Write an annotation of Text 7 in English.

Task 32

Look through Text 8 and say what tools are described in it.

Text 8

New 2200 Series row-crop cultivators from Case IH give you aggressive, chemical-free weed control and soil cultivation for profit-boosting productivity. These new cultivators offer an incredible combination of higher productivity and improved profitability.

As you know, profitability is the key to any wise weed-management decision at $3.17 to $4.75 USD per acre, row-crop cultivators provide both an economical and chemical-free solution for effective weed control. It's also a low-cost strategy to address weed shifts and avoid build-up of herbicide resistance. Agronomic advantages of mechanical cultivation include improving plant health through weed kill, soil aeration, seedbed preparation and precision placement of fertilizer.

To help you get more done in a day, these new cultivators can travel at faster operating speeds with effective weed kill in the heavy residue conditions of mulch till and no-till fields. Plus, you get the versatility of a precision tillage tool for additional duties such as building ridges, applying liquid fertilizer or anhydrous. By performing multiple operations with one machine, you're sure to see the savings in time, fuel and equipment costs.

As a precision tillage tool that provides fast, effective weed kill, the versatile 2240 row-crop cultivator is ideal for high-production growers of cotton, corn, and soybean crops. The heavy-duty design allows you to accomplish several operations with a single tool. In the fall, equip the 2240 with optional listing

3. What are the five types of movement tractor drivers are subjected to during their work?
4. When has demand for Hydrostable cabs increased?
5. What are the advantages of the Hydrostable cabs?

Task 64

Find in the text the paragraph describing the results of the test carried out in Germany in 1996 and translate it into Russian in writing.

Task 65

Write a summary of the text in English.

Task 66

Read the title of Text 18 and say in what way it is connected with Text 17.

Task 67

Look through Text 18 and name the companies mentioned in connection with suspension development.

Text 18

MORE SUSPENSION DEVELOPMENT

Massey-Ferguson has a different suspension system. It was introduced in the year 2000 for the 6200 and 8200 series tractors from 105 HP upwards and is called the Quadlink system. It consists of moving links, plus one hydraulic ram and a set of hydraulic accumulators, and there is also an electronic control operating the hydraulic valves maintaining the optimum pressure in the accumulators. The ram and the accumulators provide the shock-absorbing action and the system allows up to 90 mm (3.54 in) of vertical travel.

The Italian-based same Deutz-Fahr tractor and machinery group also has its own front-axle suspension unit. The pivoting

action of the front axle is linked to a strut located longitudinally and allowing a 22-decree arc of movement. The strut is joined to the front-axle support by two double-acting hydraulic cylinders, and these are linked to three gas-filled accumulators to provide the shock absorption function. When the Same Deutz-Fahr system is operating, the cylinders raise the axle by 45 mm (1.77 in), and it is automatically lowered again when the system is deactivated.

A cab suspension system has also been available on some Same group tractors since the year 2000, and this is claimed to be the first of its kind with a self-levelling action.

Caterpillar Challenger tractors are marketed throughout Europe and in some other countries under the German-based specialist manufacturer Claas name colours.

A special feature of the front suspension system on some Case IH and Steyr tractors is that it operates on the front wheels instead of the axle. The advantage claimed for this arrangement is

form to the customer's specification, but converted to comply with varied applications, soils and tractors.

The Case frame is 2.97 m wide, with three square hollow-section crossbars spaced 760 mm apart. To this can be bolted either single-bar stub-beams, two-bar short wings or three-bar long wings bringing the overall width to 3.38 m, 3.96 m or 4.77m, respectively. Combinations of these extensions are also possible, the maximum width being 5.76 m.

Working width vary from 2.45 m to 5.57 m and approximate weight from 502 kg to 1.505 kg. This caters for tractors in the range 60-140 h.p.

Tines are of two basic types: rigid and spring. The former is the well-known Terratine, cranked and with shear-pin protection, for chisel plowing and panbusting 150-200 mm deep. A new variation is the sweep for shallow cultivation (up to 100 mm), with wings which cut all the ground at one pass with minimum of surface disturbance.

Task 29

Find in the text the paragraph describing the basic features of the C 92 and translate it into Russian in writing.

Task 30

Discuss the information of the text answering these questions:

1. What is the type of the C 92?
2. What is the C92 designed for?
3. What are the previous types of the cultivator?
4. What are the basic features of the cultivator?
5. Can the cultivator be converted to comply with varied applications, soils and tractors? In what way?
6. What are the structural features of the C92 base frame?
7. How many types of tines can the cultivator have? What are they?

just the S-tines to work as deep as 6 inches – right from the tractor seat. An economical ratchet adjustment is standard equipment.

When you are ready to turn around, the front half of the machine lifts first. The back half eliminates any tracks in the field before lifting.

All folding models fold flat for easy transport and storage.

Task 26

Find in Text 6 the paragraph describing the unique John Deere roller wheels and translate it into Russian in writing.

Task 27

Write a summary of the text in English.

Task 28

Read Text 7 using a dictionary. Tell what the text is about. Title the text.

Text 7

Ransomes' new C92 is a mounted cultivator designed to match a wide range of medium-and high-powered tractors. It is a universal tillage tool capable of almost infinite modifications to meet a farmer's exact, and possibly changing, requirements.

Three basic features distinguish the C92, which has replaced Randoms' previous C 83 and C 87 series. They are:

- extendibility, whereby the implement can be widened by adding wing sections to the central frame to suit bigger tractors or lighter lands;
- a choice of tines and points allowing a variety of operations to be performed;
- two tine spacings selected according to the type of tine and the desired working characteristics.

The C 92 can thus be not only "made to measure" to con-

that it allows each of the wheels to move independently, thus cushioning the bumps more effectively. There is a control switch in the cab allowing the driver to activate the system or turn it off and the suspension system also controls the ground clearance by adjusting the front-axle height.

Although the obvious benefits of using a front-axle suspension are improvement in driver comfort and a possible increase in forward speed for some types of field work, additional advantages are claimed by some of the tractor companies offering this type of suspension. One of the claims is that an axle suspension helps to maintain a more positive contact between the tractor front wheels and the ground surface, particularly where the ground is uneven. This can help to improve stability and safety when the tractor is traveling at speed, and with a powered front axle it can also mean improved tractor efficiency.

Task 68

Read Text 18 to find answers to the given questions. You may use a dictionary.

1. What is called the Quadlink system?
2. What are the main features of the Same Deutz-Fahr suspension system?
3. What is a special feature of the front suspension system on some Case IH and Steyr tractors?
4. What are the obvious benefits of using a front-axle suspension?
5. Are there any additional advantages offered by a front-axle suspension? What are they?

Task 69

Find in Text 18 the paragraph describing the Massey-Ferguson suspension system and translate it into Russian in writing.

Task 70

Write a summary of Text 18 in English.

Task 71

a) Read the title of Text 19 and say what it is about.

b) Before reading Text 19 look through Text 16 once again and try to guess what other tractors of driver comfort may be mentioned in Text 19.

c) Now look through Text 19 and see if you are right.

Text 19

IMPROVING CAB DESIGN

As well as suspension systems and equipment such as radios and air conditioning in the cab, driver comfort and convenience also includes a wide range of other factors, with various aspects of cab design playing an important role. During the 1980s and 1990s, all the leading tractor manufacturers improved their cab designs, with emphasis on more internal space, flat, uncluttered floor area, and, particularly, much bigger windows. The size of the windows, together with narrow window pillars, is important for good all-round visibility, making it easier to manoeuvre the tractor accurately and safely where space is restricted.

Other visibility factors include moving the exhaust and air cleaner stacks away from the driver's forward line of vision and providing a downward-sloping bonnet line for the front of the tractor to extend the view from the driver's seat.

The downward-sloping front is important for safety reasons, as it allows the driver to see the ground closer to the front of the tractor, but another reason was the growing importance of the front-mounted equipment. Good forward visibility is even more useful when working with front-mounted equipment such as a loader or an inter-row cultivator.

Manufacturers (Deutz, Massey-Ferguson, Landini) intro-

given depth?

6. What feature of the 970 provides easy transport and storage?

Text 6

JOHN DEERE 970 ROLLER HARROW

The 970 Roller Harrow tackles any cracked, parched field and transforms it into a smooth seedbed. And compared to other roller harrows, the 970 is simply put together better.

For example, the special scraper blade adjustment makes it easier to keep blades aligned with roller wheels. The roller tube design doesn't use troublesome center bearings. Roller wheels turn independently and slide on and off for easy replacement. And the unique John Deere roller wheels provide more strength and durability than ordinary wheels because they have shorter spokes.

The 970 provides two wheel choices. Solid packer wheels are excellent at firming the soil. And if the soil is prone to heavy clods, you can choose crowfoot wheels to scatter clods and firm soil.

Optional independent hydraulic S-tine control lets you ad-

moth working widths range from 47 to 62 feet. That's plenty of size to knock out big acres fast.

C-shanks give you 24 inches of underframe clearance and 135 pounds of trip force maintains constant sweep depth in heavy residue conditions. Standard shank spacing is 6 inches, and you can choose 9-inch spacing for even better residue flow.

Fore-and aft clearance is an impressive 125 inches. That's nearly double the clearance on the previous model.

The 985 is tailor-made for today's large-acre, high-residue fields.

Task 21

Read the text and state its character. You may use a dictionary.

Task 22

Write an annotation of the text in English.

Task 23

Advertise the cultivators described in Text 5.

Task 24

Read the title of Text 6 and say what the figure "970" means.

Task 25

Read the text using a dictionary to find answers to these questions:

1. What field does the 970 Roller Harrow tackle?
2. Why does the 970 have no center bearing problems?
3. In what way do the roller wheels provide more strength and durability?
4. What are the two wheel choices provided by the 970?
5. How is it possible to adjust the S-tynes to work at the

1990s. A much steeper bonnet slope made it easier to work with equipment on the front linkage and thus styling feature earned them the nick-name "Snoopy" tractors.

The design of instrument and control layouts is also an aspect of driver convenience, and so is the design of the steps giving access to the cab, with non-slip surfaces for increased safety.

The high- horsepower STX models in Case IH's tractor range are offered as standard models with four-wheel drive.

The Zetor tractor company in the Czech Republic has produced other design features to make life easier for the driver. Air compressors linked to an airline and powered from the power take-off have been standard equipment on Zetor tractors for years.

anywhere on the farm, to blow dust and debris out of a radiator grille or to operate power tools such as air drills for carrying out repair work in the field. Another design feature on some Zetor models is a clean-water container located in the engine compartment where it collects waste heat from the exhaust manifold. After the engine has been running for a while, the container gives the driver access to a supply of warm water for hand washing – a convenience factor that deserves to be more widely available.

Task 72

Read Text 19 and say what information appeared quite new to you. You may use a dictionary.

Task 73

Read Text 19 once again to find answers to these questions:

1. What were the cab improvements made during the 1980s?
2. What are the reasons for the downward sloping front importance?
3. What are "Snoopy" tractors?
4. What are the design features produced by the Zetor tractor company?
5. Why is clean water container on some Zetor models a convenience factor that deserves to be more widely available?

Task 74

Find in Text 19 the paragraph describing Zetor tractors and translate it into Russian in writing.

Task 75

Write a summary of the text in English.

Task 76

eliminates rockshaft play and oil transfer between cylinders.

If you own a 55,60, or 7000 series Tractor, you can opt for new electrohydraulic depth control. It lets you control depth with your 3-point-hitch control. It provides more precise depth control than you've ever imagined, and boosts productivity by keeping you in tractor cab.

If you operation involves confined fields where quick, sharp turns and tight transport dimensions are important, you'll love the hitch-mounted maneuverability of the 960 Integral Field Cultivator.

It's available with vibrating S-tines or heavy-duty C-shanks. Working width range from 10 to over 25 feet, the smallest of which requires a tractor of only 40 horsepower.

Like its drawn cousin, the 980, the 960 offers three optional finishing attachments to create the perfect seedbed in your soil conditions: a coil-tine harrow; a spike-tooth harrow; and rolling baskets. Optional spray equipment provides trip-saving application of preemerge chemicals.

If you need a big field cultivator for use in heavy residue, check the specs on the 985. This five-section acre-eater's mam-

Task 20

Read the title of Text 5 and say what seedbed machines are described in it.

Text 5

JOHN DEERE FIELD CULTIVATORS

The 980 Field Cultivator is completely redesigned to provide you with a more reliable seedbed machine.

And, with many sizes and styles, there's sure to be a 980 Field Cultivator for you. Working widths range from 12 to 44 feet, with eight new narrow-frame flex-fold models from 20 ½ to 28 ½ feet. Choose tall and tough C-shanks, or vibrating S-tines. Both feature improved residue-handling capacity. Plus, you can choose from three finishing attachments: a coil-tine harrow (featuring a convenient, new flip-up feature), a spike-tooth harrow, or rolling baskets.

The 980 is built tough to handle high use … and high residue. Plus, many options let you customize the 980 to your working conditions.

Two spacings are available for each shank style. On S-tine models, choose 4½ - or 6-inch shank spacings. On C-shank models, go with 6-or 9-inch spacings. Narrow spacings give better chemical incorporation and seedbed leveling, while wide spacings offer better residue flow.

If you farm contours and terraces, choose a narrow-frame model. They flex to hug the ground and they fold up tight for narrow transport.

Finally, three seedbed attachments let you fine-finish fields just the way you want them.

Standard on all 980 Field Cultivators is the new single-point, crank depth control. It is less touchy and easier to set, and it is mounted on a new, 3-cylinder, series hydraulic system. This new system maintains your depth, with fewer problems, as it

Read the title of Text 20 and its first paragraph and say why the author of the text speaks about reviving the crawler tractor.

Text 20

REVIVING THE CRAWLER TRACTOR

The non-stop success of four-wheel drive during the second half of the twentieth century was bad news for the crawler tractor Salespeople. Farmers and contractors who needed extra pulling efficiency could turn to four-wheel drive tractors instead of trying to cope with the disadvantages of the traditional tracklayer and sales slumped. If the decline had continued, new crawler tractor would soon have qualified for endangered species status, but, instead, of fading out of existence, tracklayers have stayed a significant recovery. By the turn of the century, they were recognized as the star performers in an otherwise gloomy tractor market in Britain and other countries.

The development that revived the tracklayer's fortunes was the introduction of rubber tracks to replace the traditional steel versions. The idea was developed in the United States by Caterpillar, and the first production tractor equipped with the mobil-trac drive system with tracks or belts made of rubber reinforced with flexible steel cables was the Caterpillar 65 in the United States in 1987, and it arrived in Europe in the following year. The 65 was powered by a six-cylinder Caterpillar 3306 series engine producing 285 HP and providing 216 HP at the drawbar, but it was the mobil-trac rubber tracks that were the significant feature of the new tractor, and the initial response was sceptical.

Rubber tracks retained all the practical virtues of the traditional tracklayer, including the unbeatable pulling efficiency in difficult soil conditions. The large contact area of the tracks on soil surface helped to spread the weight of the tractor and reduce the ground pressure and the risk of soil damage. But the Chal-

speeds and lack of road use that had already persuaded many thousands of farmers to switch from the traditional steel tracks to a four-wheel drive tractor.

In many cases, the performance of the rubber tracks probably exceeded expectations. They have proved their ability to turn large amounts of engine power into drawbar pull, and the tracks are surprisingly durable when used on the road. The Challenger range now extends to 400 HP-plus, and the tractors are available throughout Europe and in some other overseas markets under the Claas name and colours.

In Britain, the Track Marshall company based in Gainsborough, Lincolnshire, offered the TM200 tracklayer with an Australian-designed rubber track system. A 200 HP Cummuns engine powered it, and the hydraulically operated steering was controlled by a steering wheel instead of the traditional levers. A special design feature was a sideways – tilting cab, operated manually by two hydraulic rams to give access to the area below the cab floor for servicing and repairs.

The TM200 was soon shaped out after sales proved to be disappointing, but there were other rubber-tracked rivals that were more successful. They included Case IH's Quadtrac models based on the high-horsepower Case Steiger tractors with articulated steering, but with four rubber track units instead of four driving wheels. The QuadTrac models were updated in the year 2000.

John Deere moved into the market with rubber-tracked versions of its 8000 series rigid-frame tractors. The range has more recently been extended with the addition of rubber track conversions of the pivot-star 9000 range with power output up to about 425 HP.

Japan'Morooka range of crawler tractors was among the earliest converts to rubber tracks, and the rubber track revolution has also spread to other farm equipment, with conversion kits available for machines ranging from combine harvesters and self-propelled potato harvesters to small two-wheeled pedestrian-

is excellent.

If you need to move towards higher residue levels, the Mulch Master may be the way to get there.

Task 17

Read Text 4 using a dictionary to find answers to these questions:

1. What is the key to the 550 Mulch Master's incredible performance?
2. How does the 550 Mulch Master work?
3. Why did one farmer who tested the Mulch Master for two years call it a "burndown"?
4. What can the Mulch Master do in wheat?
5. Can the 550 Mulch Master be used in this country?

Task 18

Find in Text 4 the paragraph describing the advantages of the 550 Mulch Master and translate it into Russian in writing.

Task 19

Write a summary of Text 4 in English.

thorough seedbed tillage and conservation farming. The key to the Mulch Master's incredible performance is the double rank of patented cupped-tooth incorporator wheels. In a conservation tillage system, their churning, digging action kicks beried residue back up to the surface. And in any tillage system, their unique mixing action thoroughly incorporates chemicals in just one pass. Other advantages include weed-free, planter-ready seedbeds, and fast operating speeds.

Now you can take a closer look at the machines many features, and see how the Mulch Master can work for you:

- free-flow spacing. Shanks are spaced 20 inches apart for smooth residue flow;

- conforms to contours. Each pair of incorporator wheels is independently mounted on spring-loaded arms to accurately follow soil contours, and provide protection from small rocks;

- unique soil flow. Wheel ranks are mounted at opposing angles. Soil flows first to the right, then quickly back to the left for excellent chemical incorporation. Wheels are spaced 10 inches apart for good residue flow, but the double rank design provides a 5-inch effective spacing for complete coverage.

One farmer who tested the Mulch Master for two years said, "You could call it a burndown". And the burndown he was referring to doesn't come in a plastic bottle. After the Mulch Master's sweeps undercut weeds (that same farmer reported good success in giant ragweed as high as the top of his tractor tires), the incorporator wheels knock the soil from weed roots, and toss them on the surface to die.

And when it comes to a seedbed expect one ready to plant. The Mulch Master's sweeps first loosen the soil for a mellow seedbed. Then the incorporator wheels evenly mix soil and residue for a smooth profile.

In wheat and similar small grains the Mulch Master's sweeps cut out weeds, while the incorporator wheels fluff straw up on the surface. One-pass incorporation of liquid or dry chemicals

controlled tractors.

Fendt introduced the Vario transmission on the high-horsepower 926 model.

Task 77

Read Text 20 to find answers to some questions. You may use a dictionary.

1. What development revived the tracklayer's fortune?
2. Where was the idea of rubber tracks developed?
3. What US tractor was the first to use rubber tracks?
4. What practical virtues of the traditional tracklayer did rubber tracks retain?
5. When were the Quadtrac uprated?
6. What can you tell about John Deere rubber-tracked versions?
7. What country producing crawler tractor is also mentioned in the text?

Task 78

Find in the text the paragraph describing the performance of the rubber tracks and translate it into Russian in writing.

Task 79

Write a summary of the text in English.

Task 80

Render Text 21 in Russian using no dictionary. Comment on its contents. Title the text.

Text 21

North American manufacturers have never shown much enthusiasm for air-cooled tractor engines, and liquid cooling has dominated the industry there since the early years of tractor development. British tractor designers sided with their US counterparts and preferred liquid cooling. In Europe by the late 1970s some tractor manufacturers (Deutz and Same) were specializing in air-cooled engines, while most of their rivals had standardized on liquid cooling.

Liquid cooling does have some disadvantages. The cooling system includes a bulky radiator, pipes, connections, a pump and a cooling fan with a belt drive, and these are all items that can lead to mechanical problems and reduced reliability. Other problems with a radiator-based cooling system are the risk of expensive frost damage in cold weather and the fact that a liquid-cooled engine also takes slightly longer than an air-cooled unit of similar size to reach its optimum working temperature. A slower warm-up period allows more time for condensation to form on the cylinder walls, and this can lead to problems.

Advocates for liquid cooling, championed particularly by Perkins Engines and Ford, claimed significant benefits for their system. Having a big volume of liquid - normally water with added antifreeze and corrosion inhibitors – in the cylinder block

easily over residue piles, waterways and dead furrows. They also cut down on bulldozing in soft soils and reduce tire wear by improving weight distribution.

Task 13

Read Text 13 using a dictionary to answer these questions:

1. When did John Deere build the first successful plow?
2. What are the advantages of John Deere 2-Way plows?
3. What is the main application of the 965 2-Way On Land Plow?
4. How does the 965-Plows frame look like?
5. What do the 965-Plows Special landsides create?
6. How can the 2810 semi-integral plow help control insects, weeds and plant diseases?
7. What plow can move nimbly over uneven terrain?
8. What is the best performance feature of all John Deere plows?

Task 14

Find in the text the paragraphs describing the John Deere 2-Way plows and translate them into Russian in writing.

Task 15

Write an annotation of Text 3 in English.

Task 16

Look through the first paragraph of Text 4 and name the main advantages of the 550 Mulch Master.

Text 4

JOHN DEERE 550 MULCH MASTER

The 550 Mulch Master gives you the best of two worlds:

They also help your plow maintain more consistent depth and have less bounce during transport.

The 3710 Drawn Flex Plow's mainframe is hinged in the middle, so you can move nimbly over uneven terrain without gouging or scalping contours and low spots. And you'll find this flex plow incredibly easy to steer, because the two-piece mainframe gives you one piece turning.

Generous 34 inches of fore-and-aft clearance and 33 inches of under frame clearance provide plenty of room for heavy residue.

Lastly, there's high performance. The best performance feature of all is adjustable width of cut.

Both rigid and flex 3710 Plows feature light-draft NU bottoms. Their unique design delivers excellent turn-over, better scouring and easier pulling. You'll save fuel, and frustration.

3710 Drawn Rigid plow is available with 6,7 or 8 bottoms for perfectly formed furrows in a variety of field conditions.

Flex models have Walk-Over land wheels to let you cross

provides a sound-absorbing effect, and even the most loyal fans of air cooling will sometimes admit that their engines are noisier.

One of the developments was the demand for tractors with more power, and cooling by air becomes less efficient as the size of the engine increases above 150 HP. The other factor that gave liquid cooling a significant advantage is the increasingly stringent legislation in place to clean up engine exhaust emissions in Europe and North America. Liquid cooling offers small but significant benefits in this area of engine performance. During the 1990s, the number of tractors equipped with air-cooled engines reduces steadily.

Task 81

Read the title of Text 22 and say what its main idea is.

Task 82

Read Text 22 to find answers to the questions that follow the text. You may use a dictionary.

Text 22

ENVIRONMENTAL CONSIDERATIONS

Exhaust emission regulations have dominated the development of new tractor engines since the late 1980s, as the designers struggle to keep pace with over stricter legislative control. The limits are genuinely difficult to meet, and most of the leading engine manufacturers have been forced to scrap existing designs and introduce new power units capable of reaching the required performance levels. The cost of the research and development work and of bringing the new "clean" engines onto the production line is enormous, and it is a cost that is inevitable passed on to the farmers and contractors who buy the tractors.

Because of the member involved, tractors make a relatively small contribution to the global total of engine exhaust emissions and a correspondingly small contribution to air pollution and envi-

ronmental damage, so the cost of cleaning the emissions is high in relation to the problem it solves. The consolation for customers who have to foot the bill is that cleaner engines are generally more fuel efficient. High levels of carbon and other particles in the exhaust gases are often a result of inefficient or incomplete combustion, and improving the maximum amount of energy from each tankful of fuel.

Adding a turbocharger, often with an intercooler or charge cooler as well, helps to boost the power output from an engine. It also makes a contribution to cleaning the exhaust, and the emphasis on meeting the emission legislation has encouraged tractor manufacturers to include turbochargers as almost standard equipment on engines above about 100 HP. They are also widely used on engines in the 60 HP to 100 HP range.

1. What have dominated the development of new tractor engines since the late 1980s? Why?
2. Why have most of the leading engine manufacturers been forced to introduce new power units?
3. Why do tractors make a relatively small contribution to the global total of engine exhaust emission?
4. Nevertheless, what can the result of engine exhaust emission be?
5. What development makes a contribution to cleaning the exhaust?

Task 83

Find in the text the paragraph describing a turbocharger and translate it into Russian in writing.

Task 84

Write a summary of Text 22 in English.

Task 85

Look through the first paragraph of Text 23 and say

from front to rear. Weight is evenly distributed for uniform penetration.

The 965 2-Way On- Land Plow is the ideal plow for a variety of large-acreage/high horsepower applications, including cotton, peanuts, soybeans, vegetables and other crops with light to moderate soils.

Choose a 5-, 6- or 7-bottom model, each with an 18-inch width of cut. All feature a V-style mainframe for even weight distribution and good penetration. The frame is made of high-strength 3×7-inch tubing to stand up to high – horsepower tractors. And the integral on-land hitch gives unexcelled maneuverability in turns and tight parking spots. It also provides ample clearance between tractor tires and plow. It lets you maneuver easily in tight situations.

Special landsides create ample furrow wall pressure in hard soils. For soft soils, a double-landside option is available on the 5- and 6-bottom 965 plows. Singe-piece standards provide reliability.

Field conditions and soil types change and that can put a lot of strain on the tractor if the plow is not equipped to ease power loads. So the 2810 semi-integral plow features an adjustable width of cut. In minutes, you can change cutting width to make the most efficient use of the horsepower.

Adjustable width of cut also lets you fine-tune tilth. Widen the width of cut, and you can completely bury residue to help control insects, weeds and plant diseases. Or narrow the width of cut to leave bands of residue that reduce soil erosion and preserve moisture.

And nearly 34 inches of under frame clearance gives you free-flow performance. So you can handle 165-bushel corn stover as easily as a 95-bushel field. A scissor-type landing is available to let you make sharper turns without scuffing or puncturing the tire. It also helps reduce headlands for faster, easier plowing.

Massive 8×8-inch mainframes on both rigid and flex models of 3710 Drawn plow let you bust through the toughest fields.

Task 10

Read the title of Text 3 and say what plows are described in the text.

Task 11

Answer the question: "Is the name John Deere known to you? Why?"

Task 12

Look through Text 3 and say how many types of plows are mentioned in it. What are they?

Text 3

JOHN DEERE… THE FIRST NAME IN PLOWS

In 1837, John Deere built the first successful steel-bottom plow. Farmers readily adopted the new tool, and turned the fertile, but previously untapped, prairie soil into the richest crop-producing land in the world. The choice became simple. It still is.

Today, John Deere offers an advanced line of plows – plows built for the modern farmer: semi-integral, drawn and two-way reversible plows. All with the same legendary quality that has kept John Deere in business for will over 150 years.

John Deere 2-way plows give you some definite advantages in the field and on your bottom line. The unique pivoting 2-way design helps you finish your plowing job faster. Just reverse the moldboards to make left - and right – hand passes. These 2-way plows have just one set of bottoms, rather than two. They cost less and require less maintenance than any conventional rollover plow. They also demand less horsepower and hydraulic lift capacity from the tractor.

The 5-bottom 3955 plow is the biggest in-furrow, 2 way model having strong, easy-pulling V-frame. One-piece welded mainframes resist torsional stresses to maintain level plowing

what systems have provided one of the most rapidly developing areas of farm mechanization. Title the text.

Text 23

Another trend in engine design since the early 1980s has been a big increase in the use of electronic control systems on tractor engines, and on some of the biggest engines this can now amount to an almost totally computerized engine management system. Electronics have been available on farm equipment since the late 1970s, when they were used on complex machines such as combine harvesters to provide a driver with a comprehensive information system on the operation of key components, using sensors to gather the data. With electronics and computers, it is relatively easy to move from simply conveying and displaying information to processing and using the data in a control function. In spite of some misgivings from farmers who were concerned about the reliability of this type of equipment when exposed to the dust and vibration associated with field machinery, electronic information and control systems have provided one of the most rapidly developing areas of farm mechanization.

The biggest breakthrough in the use of electronics on tractors was introduction of the Massey-Ferguson information and control systems. They were announced in 1986, providing the driver with a comprehensive data display as well as automatic control systems including full electronic control of the rear linkage. The Datatronic II version available in the late 1990s monitors 20 different functions and includes programmable memories, plus data transfer by smart card or through a hard-copy printout facility. An additional function is automatic wheelslip control, comparing the apparent travel speed, as indicated by measuring the driving wheel rpm, with the actual forward speed measured by a radar unit. This constantly monitors the amount of wheelslip, and the control system can automatically adjust the working depth of the plough or cultivator to reduce the pulling power needed and there-

fore reduce the wheelslip. Not only Massey-Ferguson, but other manufacturers have also introduced comprehensive systems producing large amounts of performance-related data and computer control systems.

The ultimate in two-way or bi-directional tractor control is provided by the Claas Xerion tractor with movable cab.

Massey-Ferguson also pioneered another major hi-tech developments in agricultural mechanization. This was the use of signals received from the global positioning system (GPS) network of space satellites to identify the position of a machine such as a tractor or a combine harvester as it travels to and fro across a field. The GPS satellite network, more than 19,300 kilometers (12,000 miles) above the surface of the Earth, is maintained by the United States for military purposes. It is also used for a wide range of other functions, and Massey-Ferguson began its research programme in the mid – 1980s using a signal receiver on a combine harvester.

Text 2

Research has demonstrated that normally the moldboard plough (plow) is the most efficient tool for pulverizing the soil and covering the trash to provide a satisfactory seedbed.

The modern plow is mounted directly behind the tractor, attached to the three-pointed linkage, being raised and lowered hydraulically. The typical mounted plow consists of a frame which is attached to the tractor. The main components in contact with the soil are the coulter, the share, the moldboard and the landside. The coulter is carried by the frame of the plow. The share, moldboard and landside are all bolted to the frog which, in turn, is bolted to the leg of the plow. The plow leg is carried by the frame.

The share is a triangular piece of steel or cast iron. Its job is to penetrate and then undercut through the soil at the desired depth.

The function of the coulter is to make a vertical cut and divide the soil being raised by the share from the underplowed land. The combination of the share and the coulter creates the furrow.

The moldboard is the part of the plow which turns the furrow over and consists of a long, curved piece of hardwearing steel.

Task 7

Read Text 2 using a dictionary and name the main parts of a plow. Describe their functions.

Task 8

Find in the text the paragraph describing the function of the coulter and translate it into Russian in writing.

Task 9

Write a summary of the text in English.

blocks of information are. Title the text.

Task 3

Read the text using a dictionary to find answers to these questions:

1. What was the most elementary method of modifying soil conditions?
2. How can you describe the greatest mechanical advance during the early days of agriculture?
3. Why is the plough considered to be the most important tillage tool?
4. Was the roller employed in agriculture during the middle ages?
5. When was the term "farm machinery" introduced?
6. What is a threshing-machine? When was it invented?
7. How did the internal combustion engine contribute to the mechanization of the farm in the second decade of the 20th century?

Task 4

Find in the text the paragraph describing the events that took place in the 18th century and translate it into Russian in writing.

Task 5

Write a summary of Text 1 in English.

CULTIVATING, SEEDING AND PLANTING MACHINERY

Task 6

Look through Text 2 and say what it is about. Title the text.

Moving the Xerion cab is a pushbutton job.

Tractors equipped with GPS receivers and equipment for data processing can be used to apply inputs such as seed and fertilizer, using the yield map information to adjust the application rate to match the yield variations. Field maps can also be prepared showing areas of weed infestations to allow the sprayer to be controlled automatically, applying herbicide on the problem areas but reducing the dose where the field map shows few weeds are present. Using GSP has allowed the development of what has been called “precision farming”, allowing farms to be managed by the square metre instead of on a field scale. As well as economic advantages this provides, it can also bring environmental benefits through more precisely targeted use of chemical inputs such as pesticide sprays and fertilizers.

Task 86

Read Text 23 to find answers to these questions. You

may use a dictionary.

1. Are there any almost totally computerized engine management systems?
2. What do electronics and computers can provide the driver with?
3. When were Massey-Ferguson information and control systems announced? What did they provide the drive with?
4. How many functions does the Datatronic II version monitor? What memories does it include?
5. What is an additional function of the Datatronic II version?
6. What another major hi-tech development in agricultural mechanization did Massey-Ferguson pioneer?
7. What is GPS?
8. How can tractors equipped with GPS receivers be used?
9. What is a field map?
10. Haw can you describe “precision farming”?
11. What advantages can be brought by “precision farming”?

Task 87

Find in the text the paragraph describing tractors equipped by GPS receivers and translate it into Russian in writing.

Task 88

Write a summary of the text in English.

Task 89

Read the title and the first paragraph of Text 24 and say what CVT is.

Text 24

THE CVT

The advent of the plough enabled man to supplement has labour by animal power and is one of the great landmarks of agricultural progress.

The plough is the most important tillage tool, and it has been brought to its present state of scientific perfection only after tireless experimentation.

During the middle ages the variety of implements had advanced but little, though the roller was known but was not employed generally in agriculture.

In the eighteenth century there was conscious and organized attempt to improve agricultural implements. New methods and inventions were being applied to most farming operations, and new conditions were being created favorable for the great advance which followed.

By the 19th century such a complexity of implements had been introduced as to justify the term "farm machinery". In agriculture, as in industry, the use first of water-power and then of steam had immensely stimulated the invention of machinery supplementing or replacing manual labour. A threshing-machine was invented late in the 18th century and was gradually coming into use early in the 19th. It was driven by water or wind, sometimes by horse labour, and later by steam.

In still more recent times an important practical contribution to the mechanization of the farm came from the discovery of the internal combustion engine. Used first of all to drive stationery machinery, as chaff-cutters, root-cutters and corn-mills in the barn, in the second decade of the 20th century the internal-combustion engine also made headway as a source of power for field operations.

Farm implements and machines are now very numerous and very diversified.

Task 2

Look through Text 1 once again and say what its main

UNIT 3
FARM MACHINERY

More and more machines are used on farms today increasing labour productivity.

Machines that are used for crop production include those that till the soil, plant the crops, perform various cultural practices during the growing season and harvest the crops.

Many machines are known to be powered by tractors. Implements such as ploughs, cultivators, harrows, sweepers, drills and planters may be mounted on a tractor or they may be pulled by a tractor.

However, an increasing number of farm machines are now self-propelled. These machines are grain combine harvesters, cotton pickers, forage harvesters, and many other specialized farm machines.

In this Unit you will find some information on two main groups of farm machines: 1) cultivating, seeding and planting machinery, 2) harvesting machinery.

Task 1

Look through Text 1 and say why Unit 3 begins with this text.

Text 1

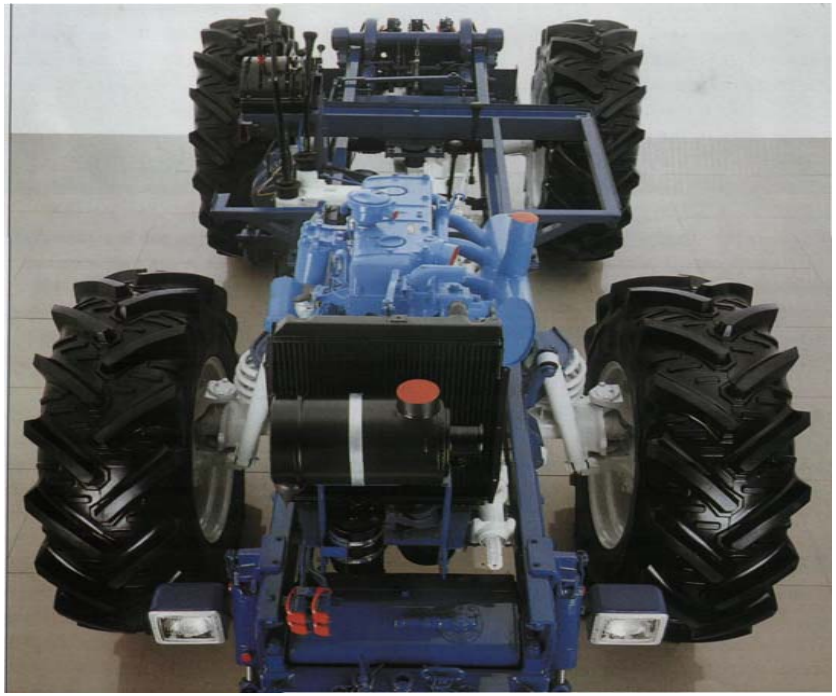
CULTIVATING AND SEEDING MACHINERY

At the dawn of history we find man practising the most elementary method of modifying soil conditions. He broke up the surface and prepared a seedbed, using for this purpose the most primitive of all cultivating devices, a digging implement like a hoe. In early times the principal crops were cereals or pulse and a fibre crop-flax.

The greatest mechanical advance during these early days of agriculture was the evolution of the plough from the primitive hoe.

Another aspect of the electronic revolution that had a profound impact on the farming industry during 1990s was the development of a new generation of tractor transmissions. Constantly variable transmissions (CVTs) are a German development and they offer the first effective challenge to the supremacy of the powershift for mid – to high – horsepower tractors. They also offer some of the benefits of the hydrostatic drive system including infinitely variable adjustment of the forward speed without altering the engine rpm.

CVTs were developed by three German companies working at about the same time, and on a basically similar approach to transmitting power from the tractor engine to the wheels, but apparently all working independently. The solution they all came up with is based on a combination of a mechanical drive with gears and the hydraulic pump and motors of a hydrostatic drive system. There is also a hi-tech electronic control system that automatically allocates more of the power to either of the two transmission components to suit the job the tractor is doing. In addition, the electronic control systems for the transmission and the engine are linked, allowing both to respond to changes in the workload. Benefits of the new generation transmissions include: smoother, more flexible power delivery with easy-to-operate controls; high mechanical efficiency than a hydrostatic drive system which is close to the standards reached by a typical powershift; and an electronic control system that can be more closely integrated with that of the engine.



This bare chassis view of a Mercedes-Benz MB-trac systems tractor shows the rugged main frame that carries the cab and includes a coil suspension system. MB-tracs include a number of advanced design features, including a reversible driving seat.

The first company to offer c CVT on a production tractor was Fendt. Their Vario transmission was available in 1995, initially on a new 260 HP tractor, but since then the sales success has encouraged Fendt to offer versions of the Vario drive system throughout the model range from 86 HP upwards. Claas, noted mainly for its harvesting machinery, introduced its HM8 drive system on the 300 HP Xerion bi-directional tractor. The HM8 is also a CVT, and it offers eight gear ratios, as well as the stepless hy-

One of the problems with solar energy is that of the amount of power available depends on the hours of sunshine. Presumably the introduction of solar-powered tractors would have to wait until more efficient batteries are available to store the electrical energy produced while the sun is shining, as having to delay an urgent ploughing or seed drilling jobs until the clouds clear could create problems.

The non-fossil fuel farmers would most welcome is bio-diesel produced from crops such as oilseed rape. Bio-diesel offers significant benefits, as it can be used in most modern diesel engines without modification, and the technology for growing and harvesting the fuel crops is already familiar. It is also environmentally friendly, as exhaust fumes from bio-diesel are much cleaner than those from engines burning petrol or diesel, and producing fuel from annually renewable crop plants reduces the impact on global warming.

Bio-diesel is already commercially available in some countries, but at this stage it is more expensive than diesel fuel, and it has to carry a lower rate of tax to enable it to compete. The economic picture may change the future as oil prices rise in response to more of the reserves being used, and there is a real possibility that farm-produced bio-diesel could make a small but important contribution to the world's energy needs.

Task 114

Make a précis on the subject "The Future of Power Farming" (Texts 27-30). Do it both in Russian and in English. Write down the two versions.

Task 115

Make a précis on the subject "Farm Tractors" (Texts 3-30). Do it both in Russian and in English. Write down the two versions.

9. How is the John Deere driverless tractor described in the text?

10. What are the problems posed by a robot tractor?

11. Why does the team behind the Japanese driverless tractor take its own line?

Task 110

Find in the text the paragraphs describing the most promising driverless tractor development which came in 1958 and Japan's first driverless tractor and translate them into Russian in writing.

Task 111

Write a summary of the text in English.

Task 112

Agree or disagree with the main ideas discussed in Text 29. Comment on the contents of the text.

Task 113

Render Text 30 in Russian using no dictionary. Comment on the contents of the text. Title the text.

Text 30

Questions about robotics are likely to be at the forefront of the debate about tractor design and operation for many years, and another increasingly important subject will be the type of fuel we use in our tractors. Finding a replacement for diesel fuel will become a major issue because, at some time during the century, the world's oil reserves are likely to be exhausted. The search for alternative fuels will become increasingly urgent, as indicated in Renault's Centaure project, which suggested solar energy would become the power source for tractor engines during the twenty-first century.

draustatic drive. The third and potentially the most important of the CVT pioneers is the German-based ZF company. It specializes in making transmissions and other components for the tractor industry, including many of the leading European manufacturers, and the first customer for its new CVT was Steyr in Austria, now linked with Case IH. New Steyr and Case tractors with the ZF CVT, covering the 120 HP to 170 HP output range, were announced in 2000. Many of the other leading tractor companies, including the Deutz range Same Deutz-Fahr and the Valtra company in Finland, announced plans to introduce CVT models, using versions of the ZF transmissions, and, in 2001, Deere announced it was adopting a ZF-designed CVT for its new mid-range tractor series.

Task 90

Read Text 24 to find answers to the following questions. You may use a dictionary.

1. What companies developed CVTs?
2. What solution did the three companies come up with?
3. What do benefits of the new generation transmissions include?
4. What company was the first to offer a CVT on a production tractor?
5. When was the Vario transmission available?
6. When did Claas introduce its HM8 drive system?
7. What company was the third CVT pioneer? What does it specialize in?
8. When were new Steyr and Case tractors with the ZF CVT announced?
9. What other tractor companies announced plans to introduce CVT models?
10. When did Deere announce it was adopting a ZF-designed CVT?

Task 91

Find in the text the paragraph describing the benefits of the new generation transmissions and translate it into Russian in writing.

Task 92

Write a summary of the text in English.

Task 93

Read the title of Text 25 and say what it is about.

Task 94

Look through Text 25 and name all the new British arrivals mentioned in the text.

Text 25

NEW BRITISH ARRIVALS

Britain, the world's biggest tractor exporter during much of the twentieth century, has produced several new arrivals since 1990, as well as a "new" brand name. The brand name is, in fact,

tiring. According to Renault, 80 percent of the energy used when driving a tractor is required to operate the steering and the other controls. Handing these tasks over to an automatic control system would allow the driver more time to concentrate on setting and checking the equipment the tractor is powering. This seems an awkward compromise, as it might make the tractor driver's job easier, but it would also devaluate it, and many drivers would not welcome a control system that reduces their responsibility to keeping an eye on the machine at the back of the tractor.

The team behind the Japanese driverless tractor project take a different line. In Japan, there is a serious shortage of tractor drivers, mainly because many young people are not attracted by the career prospects in the farming industry, and a driverless tractor in this country would be specifically designed to replace the drivers who are no longer available. In the long term, this is a more logical way to use the technology available, and sooner or later everybody will have to come to terms with tractors that do not need a driver or a machine-minder.

1. When did the first driverless tractors become available?
2. Why was the idea of a driverless not developed in the early 1950s?
3. When did the most promising driverless tractor development come?
4. Why did the interest to robotics increase at the end of the twentieth century?
5. What company was the first to demonstrate a driverless system? When did it happen?
6. When was Japan's first driverless tractor demonstrated? What was it designed for? What did the control system of the tractor use?
7. What is the Agro Nav programme?
8. Why is the year 2003 mentioned in the text in connection with Renault?

from the field after setting up the tractor for unmanned operations. The driver would also need transport back to the field later to collect the tractor and return it to the farm buildings. There is also a big question mark over who will be available to refill the seed or fertilizer hoppers, or top up the sprayer tank if the tractor doesn't have a driver, as these tasks would be difficult to automate. Driverless tractors would also pose some difficult safety issues, and there are also legal questions to be resolved before they can be allowed to roam the countryside.

Aerials and cameras mounted on the cab roof collect data and images for the automatic guidance system on the New Holland NH2550 self-propelled swather.

This is why Deutz-Fahr and Renault have both stressed that their new automatic control systems are not designed to replace the tractor driver, but will simply make the driver's job less

one of the oldest in the industry. The name chosen for the new tractors being built at the former Case IH factory in Doncaster, Yorkshire, is McCormic after one of the two old-established American machinery firms that joined forces in 1902 to form International Harvester. The name started with Cyrus H.McCormic, who designed an improved reaper and demonstrated it in 1831, taking out a patent in 1834.

It was International Harvester that had opened the tractor plant in Doncaster, and the first tractor to roll off the production line there in 1949 was a McCormic Farmall Model M. Case acquired the plant when International Harvester was taken over, and the compulsory sale of the factory was one of the anti-trust conditions imposed when the Case/New Holland merger forming CNH Global was approved. When the sale was completed in 2000, the new Italian owners, who also own the Landini tractor business, chose the McCormic brand name for the now Doncaster-built tractor range.

Two of the British new arrivals are unconventional tractors with distinctive design features which have helped to establish them. The Fastrac high-speed tractor range from GCB Landpower, available since 1991, has already been referred to because of its innovative suspension system. The Miltidrive from Thirsk, Yorkshire, also has a front and rear suspension system, but in this case based on coil springs at both ends.

When the first version of the Multidrive arrived in 1992, the year after the Tastrac launch, it was called the Clayton Buggi and was designed and built by Lucassen Young of Stockton-on-Jees, Cleveland. It was based on a chassis with four-wheel drive through equal-sized wheels, four-wheel hydrostatic steering and a large load area behind the cab. An automatic trailer braking system was provided, but the three-point linkage at the rear was an optional extra.

Licassen Young designed the Buggi mainly for carrying a demountable sprayer, but the load space can also be used for other

jobs, including carrying seed for a rear-mounted seed drill. It is not, however, designed as a heavy-duty pulling tractor for jobs such as ploughing. A 110 HP John Deere engine powered the original version, but the range was later extended to include more powerful engine options, and a version with an extended wheel-base was introduced to allow more space on the load platform. Developments of the Multidrive include a 185 HP version providing a 12-tonne (11.8 - ton) gross vehicle weight and capable of handling sprayers with up to 3500-litre (770-gallon) tank capacity.

Another new name in the tractor market is Multidrive.

Another of the British arrivals is the Smallholder Tractor Co. at Evesham, Worcestershire. While most of the established tractor manufacturers in North America and Europe have been concentrating on the big-selling medium – to high – horsepower sector of the market, Smallholder company management believes that there is also a need for a small, low-powered tractor with a

6,5 km/h (4 mph), and the GPS system controlling the steering was accurate to within 10 cm (4 in).

Germany's leading driverless tractor project is the Agro Nav programme from Geo Tec Electronics, one of the leading companies envolved in robotics research for the farming industry. Its control system was demonstrated in the year 2000 on a Deutz Agrotron tractor. At that time the company predicted that the equipment would be available commercially in 2002 or 2003. Agro Nav uses GPS to track the position of the tractor, and a computer programme automates all the control functions. This allows the tractor to operate without a driver for a wide range of field operations, and the result is said to be higher levels of precision that would normally he achieved with manual control.

The year 2003 is the target date for Renault to introduce its new Tractosat automatic guidance on a commercial basis. Renault has moved away from the voice control system featured in its previous Centaure project. The basis for its new control technology is GPS, which will provide automatic guidance, working either on its own or in conjunction with a computer programme capable of automatically sequencing a series of field operations.

Deere & Co. is using the experimental tractor to carry out research into GPS-based guidance systems. The tractor is a narrow or orchard version of the John Deere 5010 model, and by 2001 it was already capable of operating without a driver.

A driverless tractor could be available very soon, but the reality is likely to be quite different. A full-scale unmanned tractor would have a number of barriers to overcome, and one of these would be a credibility gap that would see many farmers reluctant to hand over crucially important tasks such as seed drilling, spraying and fertilizer spreading to a robot.

A robot tractor would also pose a number of practical problems. For the foreseeable future, the tractor would almost certainly need human help for the drive to and from the field, and this sug-

in 1958, when a British research team at Reading University used a modified International Harvester B 250 tractor to follow a wire buried just below the soil surface. The wire carried a small electrical charge that could be detected by a pair of sensors mounted at the front of the tractor. The two sensors were linked to the steering system, and they triggered adjustments to the steering to keep the sensors positioned directly above the wire. As well as indicating the route the tractor should follow, the wire could also be used to carry additional signals to trigger the tractor to stop, change speed, turn the power take-off on or off, or raise or lower the hydraulic linkage.

Driverless tractor research in the 1950s was limited by the technology that was available at that time, but 50 years later the options had increased considerably with the development of electronics, computer systems and the global positioning system (GPS). The result is a surge of new interest in robotics involving many of the leading tractor manufacturers.

New Holland was among the first companies to demonstrate a driverless system. That was in 1997. The machine it chose was a self-propelled swather instead of a tractor, and the company used picture analysis for the principal control system. Pictures for the guidance system were provided by two cameras mounted on the roof of the swather showing images of the edge of the standing crop.

Japan's first driverless tractor was demonstrated in 1998 at the National Agricultural Research Centre at Tsukuba, Tokyo. Based on a standard 75 HP tractor, it was designed to carry out a wide range of arable farming operations, including cultivation with a power take-off powered implement, seed drilling, spraying and fertilizer spreading. The control system used a computer and GPS system to monitor the position of the tractor as it worked to and fro across the field. To operate the tractor, the computer was programmed with a field map and precise details of the day's work. The research team designed the control system to work at

simple specification for use in small-holdings and as a runabout tractor for livestock farmers. The Small-holder tractor slots in just above the compact tractors, providing 45 HP to 65 HP, and, in addition to its UK sales, it has also attracted interest in some African countries where a simple, no-frills design is preferred.

Task 95

Read the text to find answers to these questions, you may use a dictionary.

1. Why is the word "new" in the first sentence of the text written in inverted commas (кавычки)?
2. What company opened the tractor plant in Doncaster? How did they call their first tractor?
3. What were the two anti-trust conditions imposed when the merger that formed Case/New Holland Global was approved?
4. What are the two of the British new arrivals available since 1991?
5. How was the first version of the Multidrive called and who was its designer?
6. What did Locassen Young design the Buggi for?
7. What engine powered the original version of the Buggi?
8. What does the development of the Multidrive include?
9. What is one more of the British arrivals? What tractor company is it designed by?
10. What are the main features of the Smallholder tractor?

Task 96

Find in the text the paragraph describing the Buggi and translate it into Russian in writing.

Task 97

Write a summary of Text 25 in English.

Task 98

Render Text 26 in Russian using no dictionary. Comment on its contents. Title the text.

Text 26

The biggest source of simple low-priced tractors used to be the factories in the former Soviet Union and east European countries. Belarus tractors from the huge Minsk factories in the Soviet Union, Ursus tractor from Poland, the Fortschritt range made in East Germany, IMT and Torpedo tractors from Yugoslavia, Universals from a factory in Romania, Dutras from Hungery, Zetor from Czechoslovaria – all competed on price, providing basic tractor power on low cost. Between them they supplied large numbers of tractors to the world market and they also had a significant part to play in the development of power farming in some of the less developed areas of the world.

These manufacturers have recently faced serious problems, in some cases because of financial or management difficulties, and sometime both. Additionally, the increasingly stringent exhaust emission regulations in markets such as the EC countries have produced a barrier to export sales for some of the factories in the former Communist block.

At this stage, it is difficult to predict how successfully some of the East European and former Soviet tractor factories will overcome their difficulties. Ursus and Zetor could both gain substantial benefits if Poland and the Czech Republic gain EC membership. Meanwhile, the low-priced end of the tractor market is attracting suppliers from other countries. India, South Korea and Turkey are all emerging as major suppliers of simple, low-cost tractors in the low to medium power range. They are already making strong headway into export markets.

India has the potential to become the world's principal supplier in this sector of the market. Some of the leading Western

tractors with a radio control system in the early 1950s. The control system appears to have worked with reasonable accuracy when it was demonstrated publicly, but the idea was not developed commercially because it offered no significant benefits. Having an operator sitting in the corner of the field to drive a tractor by remote control is no different in economic terms than having the same person sitting on the tractor seat and driving conventionally.

Robot control systems for tractors have already reached the prototype stage

The costings would be more attractive if remote control could be used to enable one person to drive two tractors, and several research teams working in the 1950s tried this approach. Ford's method, using British-built Fordson Major tractors, was to have a driver in one of the tractors, which was also equipped with a radio unit to control the second tractor. For most people, driving one tractor is a large enough job, and trying to control two tractors efficiently would be difficult.

The most promising driverless tractor development came

Task 106

Find in the text the paragraph describing the Centaure project and translate it into Russian in writing.

Task 107

Write a summary of the text in English.

Task 108

Read the title of Text 29 and say what tractors are described in the text. Try to remember everything you know about these kinds of tractors, now look through the text and see if this information is mentioned in it.

Task 109

Read the text to find answers to the questions that follow it. You may use a dictionary.

Task 29

DRIVERLESS TRACTORS

Engineers at the Silsoe Research Institute (SRI) developed the picture analysis system, which in 1994 they used to steer a small, driverless tractor designed for precise chemical application in vegetables and root crops. The guidance system steered the tractor down the rows and could also cope with headlands turns and the picture analysis was used to locate plants that were not growing in the rows. These could be individually dosed with a herbicide spray, while those growing in the rows were assumed to be crop plants and could be dosed with fertilizer. The aim was more efficient crop production while reducing the amount of chemical applied.

Driverless tractors have been available since the 1950s. Harry Ferguson's engineers equipped one of the US-built TO-20

manufacturers including CNH Global and Renault have made substantial investments in Indian tractor production, and there has also been technology transfer under agreement with the AGCO's Massey-Ferguson company and the Mitsubishi company in Japan. The expansion of the Indian tractor industry is likely to make India a leading supplier of low-priced, small – to medium – horse – power tractors for developing countries for the foreseeable future. The biggest long-term threat to India's position in this market is likely to come from China.

Task 99

Make a precis on the subject "Shaping the Modern Tractor" (Texts 16-26). Do it both in Russian and in English. Write down the two versions.

THE FUTURE OF POWER FARMING

Predicting future developments in the tractor industry has never been easy, and ideas forecast by tractor designers in the past have often failed to materialize. Further improvements in driver comfort during the next decade are likely, and the rapid progress in electronics and computer control systems means the fully automated, driveless tractor could be just a few years away. Further on, as the World's oil wells run dry, farmers could grow their own energy crops to fuel their own tractors.

Task 100

Look through Text 27 to find answers to these questions:

1. What did the Ford concept tractor provide?
2. What company produced the Talent 25 concept tractor?
3. What was a priority of Kubota's ideas for the future?
4. When and where did one more attempt to predict tractor design changes come?

Text 27

PREDICTING THE FUTURE

At a time when the only comfort provided for the majority of farm tractor drivers was a plain metal seat on a spring, the Ford concept tractor provided a cab equipped with air conditioning, a cool box for drink or food, and a heater. When details of the tractor were released, they attracted widespread media coverage, but some of the reports commented that the cab equipment was excessively lavish, and the farmers would not be willing to pay for so much luxury. There were three external Cameras on the Talent 25 concept tractor produced by Kubota for its display at the 1970 World Fair in Japan. The tractor represented the Kubota prediction of how tractors would develop in the future, and the cameras allowed the driver to view what was happening at the rear of the tractor and at both sides. The reason for the side-view cameras is far from clear, and the rear-view camera may also have been unnecessary, as the 25 HP Talent included a reversible driving position and controls, allowing the driver to face to the rear while operating some types of equipment.

Driver comfort was also a priority in Kubota's ideas for the future, and the Talent 25 cab was equipped with air conditioning, heating and a radio, as well as television screen for the external cameras. In fact, getting into the cab could be difficult, as access was through a pair of doors at the rear-this meant climbing over any machinery attached to the back of the tractor. Four-wheel drive through equal-diameter wheels was standard, and the hydrostatic transmission later became a popular choice for compact tractors used for grass mowing.

Another attempt to predict tractor design changes came in 1970 when United States Steel published details of its Vantage concept tractor. Although this was a design concept that existed on paper only, it was, in many ways, the most interesting and practical of the attempts to forecast the future. It was based on a V-8

place diesel fuel, and it also looked at hydrostatic transmission developments and ideas for improving traction efficiency by reducing wheelslip.

Tractor control by the use of verbal instructions was apparently one of the most prominent ideas in the Centaure project, but it was not a totally new idea, as spoken commands were used for centuries to help control teams of ploughing horses. However, this raises the possibility that the cab radio might activate the tractor's brakes or steering.

There are, of course, other concerns about voice control systems for tractors, and these are likely to include doubts about the level of accuracy offered for job demanding precise positioning such as inter-row cultivation or handling potato or fruit boxes. It could also pose problems for tractor drivers who sometimes confuse left and right.

Another uncertainty about prospects for using a voice control system is the probability that this idea has already been overtaken by other developments. These range from hi-tech systems for automating the steering to robot tractors capable of working without a driver. The technology to produce a driverless tractor has been available for several years.

1. What is one of the safest predictions in tractor making for the first few decades of the twenty-first century?
2. What idea was suggested by a team of engineers working in France?
3. What did other possibilities suggested by the Centaure include?
4. What are the main concerns about the voice control systems for tractors?
5. Where has the idea of voice control system already been used?

2. What were the main features of the Talent 25? What does the figure "25" in the name of the tractor mean?
3. How was the Talent 25 cab equipped?
4. What was the Vantage based on?
5. What did the Vantage cab features include?
6. What were the Ford, Kubata and United States steel design teams not able to predict?

Task 102

Find in the text the paragraph describing the Vantage cab features and translate it into Russian in writing.

Task 103

Write a summary of the text in English.

Task 104

Read the title of Text 28 and say what its main idea is.

Task 105

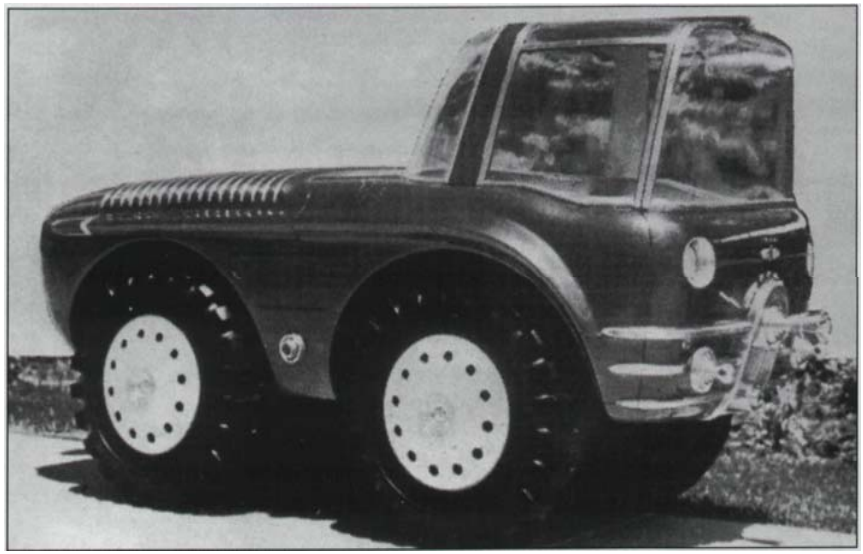
Read the text to find answers to the questions that follow it, you may use a dictionary.

Text 28

SIMPLIFYING THE DRIVER'S JOB

One of the safest predictions of the first two decades of the twenty-first century is that many of the developments will be aimed at the simplifying the tractor driver's job. One suggestion is that tractors of the future will respond to the spoken commands of the driver, presumably avoiding the chore of turning the steering wheel and pressing the brake and clutch pedals. The idea was suggested by a team of engineers working in France on Centaure, a long-term research programme set up by Renault in the mid – 1980s. Other possibilities suggested by the Centaure team included using non-fossil energy sources such as solar power to re-

diesel engine producing 250 HP at the power take-off, and four-wheel drive through large-diameter wheels was accomplished by four-wheel steering with a choice of modes, including crab steering.



Ford's 1965 attempt to predict future design developments for farm tractors resulted in the Typhoon, a half-size scale model featuring four-wheel drive, four-wheel steering, front and rear implement attachment points and p-t-os at the front, the back and both sides.

Cab features included tinted glass windows, air conditioning and a heater. Access was through a rear door from a platform behind the cab, and there was a space inside the cab for a passenger seat. A special convenience was the provision of external control panels with push buttons for operating the front and rear hydraulic linkages. The Vantage was possibly the first example of this, but within 10 years it was beginning to appear on production tractors and is now a widely used design feature.

The Ford, Kubota and United States steel design teams predicted the future importance of driver comfort and four-wheel drive with some accuracy. What they were not able to predict were some of the major developments of the 1990s, such as more stringent controls on exhaust emissions and the huge impact of hi-tech electronic controls and information systems.

Talent 25 was Kubota's concept tractor produced in 1970. It provided the driver with a well-equipped cab, including a reversible seat and a screen to show pictures from the video cameras mounted at both sides and at the rear.

Task 101

Read Text 27 to find answers to the following questions. You may use a dictionary.

1. Why did some of the reports comment that farmers would not be willing to buy the Ford concept tractor? Do you agree with the reports?
2. What were the main features of the Talent 25? What

does the figure "25" in the name of the tractor mean?

3. How was the Talent 25 cab equipped?
4. What was the Vantage based on?
5. What did the Vantage cab features include?
6. What were the Ford, Kubata and United States steel design teams not able to predict?

Task 102

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Task 103

Write a summary of the text in English.

Task 104

Read the title of Text 28 and say what its main idea is.

Task 105

Read the text to find answers to the questions that follow it, you may use a dictionary.

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