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Обучение студентов технических университетов чтению научной литературы на английском языке и развитию разговорных навыков по специальности

«Подъемно-транспортные, строительные дорожные машины (типы кранов)»

Методические указания

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UNIT 1. TYPES OF CRANES

NEW WORDS

Meeting(n)	соединение
Workload (n)	Рабочая нагрузка
Lever (n)	Рычаг
Pulley (n)	Блок
Telescope (v)	выдвигаться; раздвигаться; (подобно телескопу) складываться;
Truss (n)	ферма (балочная, стропильная); косая связь; шпренгельная система; консоль
Hinge (v)	закреплять на шарнирах; опирать шарнирно (напр. балку)
Demolition (n)	разрушение; уничтожение; снос;
Sheave (n)	шкив; ролик; блок; тяговая шайба; эксцентрик; желобчатое колесо
Span(n)	расстояние между осями рельсовых крановых путей мостового или козлового крана;
Forklift (n)	Вилочный; вильчатый погрузчик; вильчатый захват; погрузчик с вилочным захватом
Inverted (adj.)	перевёрнутый;
Hose (n)	патрубок (если речь идет о впускном или выпускном патрубке радиатора)

Hoist (n)	устройство для подъёма грузов подъём (груза); таль; подъёмная машина; подъёмный механизм; подъёмное приспособление; элеватор
Trolley (n)	крановая тележка;
Beam (n)	рукоять стрелы (крана); стрела стрелы (крана)
Crossbeam (n)	Перекладина, поперечная балка;
Bridge girders (n)	Балка мостового крана
Runway(n)	крановый рельсовый путь; проход; переходный мостик; подвесной однорельсовый путь

Exercise 1. Nouns.

Find proper Russian equivalent from the part B to the following Nouns in the part A

A

Meeting	Workload	Lever	Pulley	Truss	Demolition
Sheave	Span	Forklift	Hoist	Trolley	Crossbeam
Beam					

B

1 крановая тележка; 2 рычаг; 3 расстояние между осями рельсовых крановых путей мостового или козлового крана;4 шкив,ролик, блок; 5 разрушение,снос;6 соединение; 7 устройство для подъёма грузов,таль,подъёмная машина;8 вилочный;вильчатый погрузчик; 9 ферма (балочная, стропильная),консоль; 10 рабочая нагрузка ; 11 перекладина, поперечная балка; 12 рукоять стрелы (крана); стрела стрелы (крана)

Exercise 2. Adjectives.
Find proper Russian equivalents from the part A to the following Adjectives from the part B

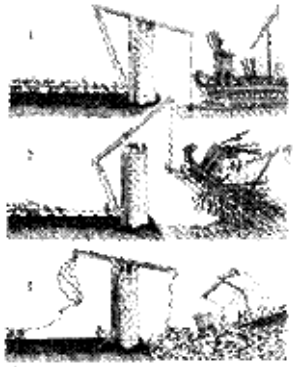
A

inverted	hinged	ship-borne	telescopic	primitive
particular	mobile	adjustable	automotive	hydraulic

B

1.гидравлический; 2 закрепляемый на шарнирах;
3корабельный;4автомобильный;5примитивный;
6 мобильный, передвижной;7выдвигающийся;
8 особый, отдельный;9 перевёрнутый ;10 регулируемый

TEXT A. TYPES OF CRANES



The device invented by Archimedes to fight with enemies' ships.

All cranes represent a meeting of simple machines, used for the purpose of reducing workload. They can dig, move, create, or destroy, depending on their type. Cranes are powerful machines that use levers and pulleys to lift heavy items. Cranes have been in use for many years. The Romans used a primitive version of the crane to build and to destroy many structures. Even the Egyptians may have used crane technology to build the pyramids.

Cranes come in many styles, each designed to fit a particular task. The most basic type of mobile crane consists of a steel truss or telescopic boom mounted on a mobile platform, which may be rail, wheeled (including "truck" carriers) or caterpillar tracks.

The boom is hinged at the bottom, and can be raised and lowered by cables or by hydraulic cylinders. A hook is suspended from the top of the boom by wire rope and sheaves. Steam engines, electric motors and internal combustion engines (IC) have all been used. The load is attached to the hook and the arm moves it to the new location. The hook can be replaced with the wrecking ball and used in demolition

Portable gantry cranes are perfectly suited for maintenance, manufacturing, repairs and general material handling tasks. They have adjustable height and span and offer lifting solutions to a wide range of industries.

TEXT B

The gantry crane

The gantry crane can be positioned in locations where a forklift can't reach. The gantry crane is low in weight and can be used in areas with floor weight restrictions are an issue. Portable gantry cranes have adjustable width and can be sized down to fit through narrow doorways or tight manufacturing areas. They have very few parts and can easily be disassembled to move from one jobsite to the next. The gantry crane can be described as an inverted U-frame. The legs are supported by attached ones that often have wheels on them for easy positioning. The lifting portion is either at the top of the frame or positioned further down the frame, but still parallel to the floor.

The gantry crane is wheeled into position over the load. The load is attached and then lifted straight up. Then the entire frame is wheeled back and the load can be placed on a table, a cart or other location.

Gantry cranes can be found in machine shops, maintenance shops, welding areas, loading areas and other work sites. They can provide much needed lifting support in an easy to reposition setup. In an auto repair shop, the gantry crane is used to lift the engine or transmission out of the vehicle. The engine or transmission can be wheeled to a table for repairs. Or a new engine can be loaded into the car and held in position easily while hoses are reattached and bolts are tightened.

A gantry crane has a hoist in a trolley which runs horizontally along gantry rails, usually fitted underneath a beam. These cranes come in all sizes, and some can move very heavy loads, particularly the extremely large examples used in shipyards or industrial installations.

Overhead cranes

Overhead cranes can be found in many manufacturing companies. They are used to raise and lower loads and move them along a set track. The crane platform is positioned overhead, leaving the work area below for other equipment and workers. The crane is above the work floor, out of the way. In many cases the overhead crane is controlled by an operator who is stationed in a housing unit. Some more complex cranes may be automated and work in conjunction with a larger assembly line process. Overhead cranes come in different varieties.

The Gantry crane is supported on legs instead of being attached to the framing of the building.

The semi-gantry crane has one end supported by legs, the other end attached to the building.
Cantilever gantry cranes are either gantry or semi-gantry cranes on which the bridge girders or trusses extend beyond the crane runway on one or

both sides. Overhead cranes can be seen at work on the assembly lines of the automotive industry. They provide the power to lift heavy engines and other parts.

Storage bridge cranes

Storage bridge cranes are a type of gantry crane in which the bridge girders or trusses are supported on one or more legs and may have one or more fixed or hinged cantilever ends. These long-span cranes are typically used for bulk storage applications. Wall cranes are supported from the wall or a line of columns.

Floating cranes

Floating cranes are mounted on barges or pontoons are also essential to the shipping industry. Situated in water, they are used to construct ports, salvage ships or build bridges. They can also unload ships. They are able to handle very heavy loads and awkwardly shaped containers.

Loader cranes

Loader cranes have hydraulic powered booms fitted onto trailers. They load goods onto the trailer and the jointed sections of the boom are folded down when not in use. The loader may also be considered telescopic, as one section of the boom, in some designs, may telescope for ease of use

Stacker cranes

Stacker cranes are most frequently seen in warehouses where they work with an automatic retrieval system. For example, in huge automated freezers, these cranes can work by remote, stacking or obtaining foods as needed. This system keeps workers out of the cold.

Tower cranes

Tower cranes do not generally have a moveable base. These are often the tallest cranes and have to be assembled piece by piece. Tower cranes are used to construct tall buildings, and in the case of skyscrapers, the tower crane is often assembled and affixed inside the building itself during construction.

WORD COMBINATIONS

Part1

a meeting of simple machines	соединение простых машин
mobile crane	передвижной (мобильный) кран
portable gantry crane	передвижной портальный кран
gantry crane	портальный кран
semi-gantry	полу портальный (козловой) кран
cantilever gantry crane	консольный портальный кран
general material handling tasks	общие задачи по манипулированию грузами
adjustable height and span	регулируемая высота и пролёт
maintenance shops	станции технического обслуживания.
storage bridge crane	складской мостовой кран

Part 2

assembly line process	поточный процесс
cantilever end	консольный конец
lifting support	помощь в подъёме
an easy to reposition setup	удобное перемещение оборудования в исходное положение (удобная смена положения (груза))
wrecking ball	груша для сноса зданий
lifting solutions	решения задач, связанных с подъёмом грузов
lifting portion	подъёмная часть крана

bulk storage applications	использование в хранилищах или складахбестарного хранения(хранилищах сухих сыпучих материалов)
automatic retrieval system	система автоматического поиска

Exercise 3. Adjectives and Nouns.
Match the items from the part A to the part B.

A

crane	steel	telescopic	rail, wheeled or caterpillar
hydraulic		wrecking	general material handling
adjustable		lifting	weight

B

restrictions	ball	height and span	boom
tasks	solutions	cylinders	technology
truss	tracks	portion	items

Exercise 4. Answer the questions.

- What are cranes?
- Did our ancestors use devices similar to modern cranes?
- What parts of mobile crane do you know?
- Which purposes are portable gantry cranes suited for?
- How can you describe the gantry crane?
- Where can we see overhead cranes?
- How can we describe storage bridge cranes?
- Which purposes are storage bridge cranes used for?
- Where is the crane platform of the overhead crane positioned at?
- Can you describe the design features of cantilever gantry cranes?

UNIT 2. HOW TOWER CRANES WORK.

NEW WORDS

Slewing unit (n)	механизм поворота рабочих органов
Limit switch (n)	конечный выключатель; конечный переключатель
Fixture (n)	арматура; приспособление
Concrete (n)	бетон
Gear (n)	устройство (приспособление, механизм и т.п.); передача (механизм передачи движения)
Load moment (n)	момент нагрузки
Jib (n)	стрела грузоподъёмного крана; консоль; плечо крана
Cat-head (n)	оголовок башни башенного крана
Pour (v)	укладывать (бетонную смесь)
Tractor-trailer (n)	автотягач с прицепом; трактор с прицепом; тракторный прицеп
Rig (n)	тягач с трейлером
Mast (n)	башня
Lattice (n)	каркас; скелет; решётка
Ram (n)	подъёмник
Counterweight (n)	противовес

Exercise 1.
Find proper Russian equivalent from the part B to the following Nouns from the part A.

A

fixture	crew	concrete	torch	jib	base
pad	mast	gear	rig		counterweight

B

1.горелка, факел;2.стрела грузоподъёмного крана,консоль; 3.тягач с трейлером;4.башня; 5зубчатое колесо, устройство, приспособление,

механизм;6.бригада;команда;7. противовес;8.основание конструкции;9.опорная плита;10.бетон;11.установочное приспособление (арматура)

Exercise 2. Adjectives.
Find proper Russian equivalent from the part B to English Adjectives from the part A.

A

machinery	concrete	cable	unsupported	limit
outrageous	construction	anchor	mast	firm

B

анкерный (о болте) строительный	машинный	привычный	
канатный, тросовый	мачтовый	незакреплённый	
неопёртый	твёрдый	прочный	устойчивый
предельный	мобильный	чрезмерный	бетонный

Introduction to How Tower Cranes Work

Tower cranes are a common fixture at any major construction site. They're pretty hard to miss. They *often* rise hundreds of feet into the air, and can reach out just as far.

The construction crew uses the tower crane to lift steel, concrete, large tools like acetylene torches and generators, and a wide variety of other building materials.

When you look at one of these cranes, what it can do seems nearly impossible:
Why doesn't it tip over? How can such a long boom lift so much weight? How is it able to grow taller as the building grows taller?

Parts of a Tower Crane

All tower cranes consist of the same basic parts: The base is bolted to a large concrete pad that supports the crane. The base connects to the mast (or tower), which gives the tower crane its height. Attached to the top of the mast is the slewing unit – the gear and motor - that allows the crane to rotate: On top of the slewing unit are three parts: The long horizontal jib (or working arm), which is

the portion of the crane that carries the load. A trolley runs along the jib to move the load in and out from the crane's center.

The shorter horizontal machinery arm, which contains the crane's motors and electronics as well as the large concrete counter weights.The machinery arm contains the motor that lifts the load, along with the control electronics that drive it and the cable drum. The motors that drive the slewing unit are located above the unit's large gear.

A typical tower crane has the following specifications:

Maximum unsupported height - 265 feet (80 meters).
The crane can have a total height much greater than 265 feet if it is tied into the building as the building rises around the crane.
Maximum reach - 230 feet (70 meters)
Maximum lifting power - 19.8 tons (18 metric tons), 300 tonne-meters (metric ton = tonne)
Counterweights - 20 tons (16.3 metric tons)
The maximum load that the crane can lift is 18 metric tons (39,690 pounds), but the crane cannot lift that much weight if the load is positioned at the end of the jib. The closer the load is positioned to the mast, the more weight the crane can lift safely. The 300 tonne-meter rating tells you the relationship. For example, if the operator positions the load 30 meters (100 feet) from the mast, the crane can lift a maximum of 10.1 tonnes.

The crane uses two limit switches to make sure that the operator does not overload the crane: the maximum load switch monitors the pull on the cable and makes sure that the load does not exceed 18 tonnes. The load moment switch makes sure that the operator does not exceed the tonne-meter rating of the crane as the load moves out on the jib. A cat head assembly in the slewing unit can measure the amount of collapse in the jib and sense when an overload condition occurs.

Now, *it would be a pretty big problem* if one of these things fell over on a job site.

Why Don't They Fall Over?

When you look at a tall tower crane, the whole
thing seems outrageous - why don't these structures
fall over, especially since they have no support wires of any kind?

The first element of the tower crane's stability is a large concrete pad that t he construction company pours several weeks before the crane arrives. This pad typically measures 30 feet by 30 feet by 4 feet (10 x 10 x 1.3 meters)
and weighs 400,000 pounds (182,000 kg) - these are the pad measurements

for the crane shown here. **Large anchor bolts** embedded deep into this pad
support the base of the crane: So these cranes are essentially bolted to the ground to ensure their stability.

How Do They Grow?

Tower cranes arrive at the construction site on 10 to 12 tractor-trailer rigs. The crew uses a mobile crane to assemble the jib and the machinery section, and places these horizontal members on a 40-foot (12-m) mast that consists of two mast sections. The mobile crane then adds the counterweights.

The mast rises from this firm foundation. The mast is a large, triangulated lattice structure, typically 10 feet (3.2 meters) square. The triangulated structure gives the mast the strength to remain upright.

To rise to its maximum height, the crane grows itself one mast section at a time! The crew uses a top climber or climbing frame that fits between the slewing unit and the top of the mast. Here's the process:

The crew hangs a weight on the jib to balance the counterweight. The crew detaches the slewing unit from the top of the mast. Large hydraulic rams in the top climber push the slewing unit up 20 feet (6 m). The crane operator uses the crane to lift another 20-foot mast section into the gap opened by the climbing frame. Once bolted in place, the crane is 20 feet taller!

Once the building is finished and it is time for the crane to come down, the process is reversed - the crane disassembles its own mast and then smaller cranes disassemble the rest.

Renting a Tower Crane

The typical fee for installation and disassembly runs around $60,000. This price includes shipping the crane to the site, renting the mobile crane used to assemble the tower crane, the cost of the crew that handles the assembly, etc. A typical monthly fee for a 150-foot-tall tower crane is approximately $15,000, with an additional charge to rent the climbing frame and extra mast sections.

WORD COMBINATIONS

maximum unsupported height	максимальная свободная высота
load moment switch	концевой выключатель момента нагрузки
maximum load switch	концевой выключатель максимальной нагрузки
cat head assembly	устройство оголовка башни крана
maximum reach	максимальный вынос стрелы
maximum lifting power	максимальная подъёмная сила

Exercise 3. Adjectives and Nouns.
Find proper Noun from the part B to the Adjective in the part A.

A

working	tower	limit	common	building	large
slewing	cable	unsupported		anchor	concrete

B

fixture	counterweights	riggs	drum	crane	switch
height	bolts	materials	unit	arm	

Exercise 4. Answer the questions

1. What purposes does construction crew use the tower crane for?
2. What are the main parts of tower crane?
3. How much does it cost to install and disassemble a tower crane?
4. What is the function of a cat head assembly?
5. Why don't tower cranes fall?
6. How do tower cranes arrive at the construction site?
7. How does the crew assemble the jib and the machinery section?
8. In which way are counterweights added to the shorter horizontal machinery arm?
9. What gives the mast the strength to remain upright?
10. Where are the motors that drive the slewing unit?

UNIT 3. FORKLIFTS

NEW WORDS

Haul	доставлять; создавать тягу; транспортировать
Supply	хозяйство (оборудование и оснащение)
Invaluable	неоценимый; бесценный
Assets	имущество; ресурс; актив
Pallet	подстопное место; грузовой поддон; площадка или тара на ножках; паллет
Refurbished	заново отремонтированный
Machinery	машинное оборудование; детали машин; машиностроение;
Counterpart	аналог
Primary	основной, важнейший
Regarding	относительно; касательно;
Emissions	выхлопные газы

Saving	экономия
Initial	начальный; первоначальный; исходный; предварительный
Lifespan	долговечность; срок службы
Opting	выбор
Downside	оборотная сторона, недостаток
Downtime	продолжительность простоя
Charging	зарядка
Paving (n)	мощение улиц; дорожное покрытие
Gravel	гравий; песок; камень; щебень; (прилаг.) - покрытый гравием
Driveway	проезд; подъездная аллея
Grade	градус наклона,степень, уклон
Uneven	неровный; непрямой неравномерный

Terrain	территория; район; местность; рельеф (местности);
Debris	лом; строительный мусор;развалины;
Impede	препятствовать; затруднять мешать;
Negotiate	преодолеть
Plywood	фанера
Warranty	гарантия
Exorbitant	непомерный; чрезмерный
Shipping	транспортный
Fee	комиссионное вознаграждение ; налог; денежный сбор; комиссионный сбор

Exercise 1. Nouns

Find proper Russian equivalent from the part A to the following Nouns in the part B.

A

debris supply plywood pallet capability counterpart emissions lifespan downside

B

1.хозяйство (оборудование и оснащение);2.выхлопные газы;
3.грузовой поддон, паллет;4.функциональные возможности,характеристики;5. фанера;
6.строительный мусор;7.оборотная сторона, недостаток;8. аналог;9.долговечность срок службы

Exercise 2. Adjectives.
Find proper Russian equivalent from the part B to the following Adjective from the part A.

A

invaluable	inclement	exorbitant	available
rough	initial	manufacturing	indoor
programmable	uneven		

B

1 суровый (о климате, погоде); 2 доступный; 3 с программным управлением;4 неровный, ухабистый; 5 начальный; 6 промышленный производственный; 7 неоценимый, бесценный; 8 предназначенный для работы в помещении; 9 непомерный,чрезмерный; 10 пересечённый(о местности)

FORKLIFTS

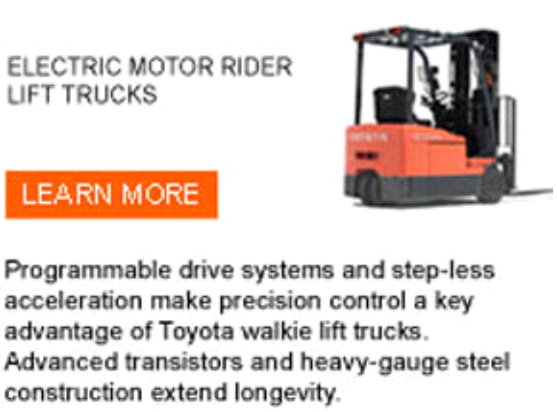
Forklifts are among the most commonly used pieces of equipment on a multitude of job sites around this country. Whether hard a work handling materials in a large warehouse or hauling supplies around a smaller job site, forklifts are invaluable assets to the construction and material handling industries. They make moving heavy products a much easier and faster process. A forklift is a powered industrial piece of machinery used to lift and transport materials, normally by means of steel forks inserted under the load. Forklifts are most commonly used to move loads stored on pallets.

The forklift has been around since the early 1920's and was manufactured and developed by various companies in need of moving heavy loads. The forklift has proven to be among the most highly used piece of industrial equipment within companies ranging from large corporations to small, self owned businesses.The forklift is a versatile tool with capabilities ranging from lifting smaller items, usually on pallets, to thousands of pounds of materials. It has since become an indispensable piece of equipment in manufacturing and warehousing operations.

Two top manufacturers of forklifts are Case and Mitsubishi. Prices are varied and can range from fairly inexpensive for used or refurbished forklifts to

several thousand dollars for others, depending on the job required for the machinery. There is a wide range of forklifts to choose from to suit particular needs. Rough terrain forklifts are used primarily in new construction worksites and clearing mountainous or hilly areas. Electric forklifts are typically used for smaller jobs that do not require as much horsepower or weight bearing capabilities. These are just two examples of forklifts available.

ELECTRIC FORKLIFTS



Electric forklifts are fairly specific to jobs in enclosed areas such as smaller warehouses where ventilation can become a problem for their gasoline powered counterparts. Electric forklifts also reduce noise pollution in small spaces as well. Many companies elect to purchase electric forklifts for two primary reasons. One is that there is no concern regarding emissions, which is important when operating the forklift in enclosed warehouses. The other advantage is the cost of fuel. Electric forklifts have a lower cost of operation than their internal combustion counterparts. This savings helps offset the initial higher cost of electric forklifts. Electric forklifts are really the best choice for warehouses, manufacturing applications, and other indoor operations

Another great advantage of electric forklifts is in reduced noise with a quieter operation. Because electric forklifts have fewer moving parts they also tend to have a longer lifespan. These are all great points to consider when opting for the electric forklift. Again, while the upfront cost may be slightly elevated the advantages will almost always make them a more economical purchase in the long run.

There are some downsides to electric forklifts, the biggest being the battery downtime. Electric forklifts are powered by batteries much like the one found in a car, only larger and much more powerful. The batteries typically provide enough power for 5 or 6 hours of constant usage, which would see you through an average 8 hour day of operation, but charging the battery takes 8 hours with another 8 hours for cooling down before it can be used again. Usually this requires the purchase of additional batteries in order to be constantly charging the next battery for use if your operation involves shift work.

FORKLIFT TRUCKS

Forklift trucks are among the most common form of this equipment with rough terrain forklifts following closely behind. Basic forklift trucks can usually be found in open work areas such as road paving, landscaping, and small construction sites. A typical forklift truck may be generally described as a motive machine with wheels and/or tracks powered through a drive train. Forklift trucks may operate on a liquefied petroleum gas or diesel fueled internal combustion engine. There are some forklifts that run on electricity powered either by direct current or alternating current by a battery

Many forklift trucks have rear-wheel steering. While this is beneficial in increasing maneuverability in tight cornering situations, it is far different than a driver's typical driving experience in an automobile. Forklift trucks have no caster action, making it unnecessary to apply steering force to maintain the rate of turn. Forklift trucks are used in industrial manufacturing plants where products are moved into a storage area or loaded onto transport vehicles used in the shipment of the goods, as well as small jobs that require moving smaller, lighter loads such as gravel for driveways or plants for landscaping.

ROUGH TERRAIN FORKLIFTS

Rough terrain forklifts are much more common on larger construction sites due to the uneven grade of the area to be covered and the fact that they can be operated more efficiently in inclement weather. Rough terrain forklifts, as the name implies, are designed to run on rough, unpaved surfaces. They are most commonly used around construction sites. They have large, pneumatic tires designed to overcome some of the roughest and uneven terrain. Rough terrain forklifts are usually powered by an internal combustion engine running on gasoline, diesel, or propane fuel. Many come with a vertical tower, which lifts loads straight up, or a telescoping boom, which lifts loads up and out from the base of the machine.

History

The first four-wheel drive rough terrain forklift was introduced in 1958 with an increased load bearing capacity of 6,000 pounds. In 1962, the first telescoping-boom rough terrain forklift came on the market. The telescoping boom allowed greater diversity to the application of the rough terrain forklift. This had a huge impact on the construction industry where construction debris or other construction work being done had impeded the progress of the standard forklift.

Today, rough terrain forklifts are a common sight on construction projects. With the ability to negotiate debris and other obstacles, they handle everything from pallets of concrete block to stacks of plywood to roof beams, making them a valuable piece of equipment by allowing different parts of the construction project to be done simultaneously.

Used or refurbished forklifts

Used or refurbished forklifts are also a choice to consider due to the fact that they are far more economical than purchasing new. Used forklifts are most ideal for those that will be using the equipment on a less frequent basis and less time consuming jobs, not requiring constant use and wear and tear. Used forklifts are also an excellent choice for those looking to reduce their overhead, especially in small, start up businesses.

Some points to consider when searching for a used forklift are maintenance records, an inspection by a qualified forklift mechanic and to ask for details on condition reports. It is a good idea to ask for digital pictures as well as extensive detail specifications on the forklift you are considering. You may want to ask if the reseller offers any kind of warranty on the machinery as well. Many resellers do offer these warranties and they can vary so be sure to fully understand what your warranty covers before making your final purchase. Another point to consider is where the used forklift is located and how the delivery is handled upon purchase. You may find a terrific bargain on a refurbished forklift only to find that the shipping fees are exorbitant, negating the very purpose behind your decision to buy used.

WORD COMBINATIONS

rough terrain forklifts	вездеходные вильчатые погрузчики
versatile tool	многофункциональный инструмент
electric forklifts	вильчатые погрузчики на электрическом ходу
weight bearing capabilities	весовая нагрузка; нагрузочная способность
upfront cost	предоплата
in the long run	в конечном итоге, в долгосрочном плане;
shift work	сменная работа
drive train	приводной механизм
liquefied petroleum gas	жидкий нефтяной газ; сжиженный газ

fuel cells	тепловыделяющие элементы
rear wheel steer	управление задними колёсами
tight corner	крутой поворот
caster action	стабилизирующее действие угла продольного наклона поворотного шкворня или оси поворота колеса
steering force	усилие на ободе рулевого колеса; сила поворота сила поворота
inclement weather	неблагоприятная погода
unpaved surface	поверхность, не имеющая дорожного покрытия
pallet stack	штабель из пакетов грузов на поддонах;
roof beam	кровельная балка; стропильный ригель; балка покрытия;стропильная балка
overhead start-up business	накладные расходы молодого предприятия
wear and tear	амортизация; износ;

Exercise 3. Adjectives and Nouns.
Find proper Noun from the part B to the Adjective in the part A

A

invaluable	versatile	indispensable	warehousing
fairly inexpensive	refurbished	particular	mountainous
hauling	gasoline powered		

B

supplies	applications	wheels	prices
operations	forklifts	areas	counterparts
tool	needs	piece of equipment	assets

Exercise 4. Verbs.
Find proper Russian equivalent to the English Verbs.

A

negotiate	refurbish	range	impede
handle	purchase	opt for	elevate
involve	run on		

B

1.повышать; 2 подразумевать; 3 изменяться (в заданных пределах);
4 обновлять; 5 преодолевать (препятствие);
6 перемещать,транспортировать; 7 покупать;8 выбирать ;
9 препятствовать ; 10 работать на

Exercise 5. Answer the questions.

1. What means of load pick-up does a forklift use to lift and transport materials?
2. When was the first forklift manufactured?
3. What are the prices for forklifts?
4. Where are rough terrain forklifts used?
5. Where are electric forklifts used?
6. Are electric forklifts specific to jobs in enclosed areas or in open job sites with uneven terrain?
7. How are rough terrain forklifts powered ?
8. Where are forklift trucks used?
9. Where can forklift trucks usually be found?
10. How can you describe a typical forklift truck?

UNIT 4. CRAWLER

Describe crawler cranes and their work using word combinations from the box.

A crawler crane	Is	a crane on tracks
	can	move around on site
	cannot	capable of traveling with a load
		very heavy
		easily be moved from one job site to another

NEW WORDS AND WORD-COMBINATIOS.

undercarriage	ходовая часть крана
lift	подъём
set-up	установка, наладка
load	груз, нагрузка

location	участок. расположение
versatility	универсальность
stability	устойчивость
mobility	мобильность
outrigger	выносная опора, выступающая балка

Terms. Glossary (definitions).
Find proper definition to the words from the part A to the part B

A

Undercarriage lift set-up load location versatility stability mobility outrigger

B

1 having a wide variety of skills

2 a projecting frame extending laterally beyond the main structure of a vehicle or a machine to stabilize the structure, or support an extending part

3 a place where something is or could be located; a site

4 the quality or state of being mobile

5 the act or process of rising or raising to a higher position.

6 the ability of an object, such as a crane or ship, to maintain equilibrium

7 the framework that supports the body of a vehicle, carriage, etc

8 the gathering and organization of the equipment needed for an operation, procedure, or task

9 an open framework made of strips of metal, wood, or similar material overlapped or overlaid in a regular, usually crisscross pattern.

10 a weight or mass that is supported

Keys:

- *Undercarriage* -7 ;*lift* – 5;*set-up* -8 ;*load* – 10 ;*location* – 3 ; *versatility* – 1 ;*stability* – 6 ;*mobility* -4 ;*outrigger* -2

LANGUAGE PRACTICE.

Exercise 1.
Match the words from the part A and the part B

A

Lift set-up load location versatility stability mobility outrigger undercarriage

B

1 участок, расположение;2 устойчивость;3 мобильность;4 ходовая часть крана;5 выносная опора,выступающая балка; 6 оборудование, наладка;7 груз, нагрузка;8 подъём;9 универсальность

Exercise 2. Adjectives and Nouns.
Read and translate the following word combinations

lattice boom
significant expense
main disadvantage
little set-up
lifting capacity
crawler crane
rail cars

TEXT 1. CRAWLER CRANE.

Read and translate.

A crawler is a crane mounted on an undercarriage with a set of tracks (also called crawlers) that provide stability and mobility. A standard crawler crane has a single boom which extends from the main body of the crane.
Crawler cranes range in lifting capacity from about 40 US tons to 3500 US tons.
Crawler cranes have both advantages and disadvantages depending on their use. Their main advantage is that they can move around on site and perform each lift with little set-up, since the crane is stable on its tracks with no outriggers. In addition, a crawler crane is capable of traveling with a load.
The main disadvantage is that they are very heavy, and cannot easily be moved from one job site to another without significant expense.
Typically a large crawler must be disassembled and moved by trucks, rail cars or ships to its next location.

The versatility of crawler cranes starts with the wide range of models , including lattice boom crawler cranes, pedestal cranes, telescopic-boom crawler cranes etc.

Exercise 3.
Answer the questions.

- What is the main advantage of crawler cranes?
- Is a crawler crane capable of traveling with a load?
- What is the main disadvantage of crawler cranes?
- How must a large crawler be disassembled and moved from one job site to another?
- What models of crawler cranes do you know?

Exercise 4.
Insert the necessary terms. Complete the sentences.

crane *vehicle* *machine* *tracks* *boom*

A crawler is a _____ mounted on an undercarriage with a set of _____ (also called crawlers) that provide stability and mobility. A standard crawler crane has a single _____ which extends from the main body of the crane.

***Exercise* 5.**
Substitute the underlined words and phrases for the technical terms given bellow.

The advantage of crawler crane is that they provide the ability of an object, such as a crane or ship, to maintain equilibrium and the quality or state of being mobile. Also they are capable of traveling with a weight or mass that is supported.

stability *lattice* *undercarriage* *mobility* *outrigger* *load*

WORD COMBINATIONS. READ AND MEMORIZE.

telescopic-boom crawler crane	гусеничный кран с телескопической стрелой
tank-building industry	танкостроительная промышленность
power transmission line erection	строительство ЛЭП
bridge construction	строительство мостов

foundation contractor	подрядчик по обустройству фундаментов
tunneling and highway constructor	подрядчик по прокладке туннелей и автомагистралей
crane rental companies	компании по аренде кранов
oil field	нефтяное месторождение
general construction companies	строительные компании

TEXT B. MANTIS.

Read and translate.

Line of hydraulic telescopic-boom crawler cranes was introduced in the USA in 1979. The earliest models of telescopic boom crawler cranes were of 10 and 13-tons capacity. Their compact dimensions were designed primarily for use in the tank-building industry.

Industries such as power transmission line erection and bridge construction soon discovered the Mantis telescopic boom crawler cranes which brought about the development of the higher capacity model(18-ton) in 1981 and a 25 ton crane in 1983.

Mantis crawler cranes are enjoying success throughout the world with general construction companies, foundation contractors, tunneling and highway constructors, crane rental companies, railroads, research agencies, as well pipeline, oil field and power line contractors.

The Mantis 3612 is the most performance proven full-size telescopic boom crawler crane in the industry. Hundreds of this bullet-proof crane have been put into service over the past 30-years and continue daily to meet the most severe of customer demands. Rated at 18-tons capacity at a wide 12ft radius the 3612 is the smallest model in the Mantis crane range.

So great is the stability of this crane with its extraordinarily low center-of-gravity that it can even walk at full nominal capacity with its tracks retracted for reduced width; … or even with the boom partially telescoped.
By doing general duties on all kinds of construction sites and erection type projects telecrawlers are an alternative to Rough Terrain Crane. Short setup times, flexible boom lengths provide an excellent operational flexibility. For easy transportation the crawlers can be retracted / folded to the chassis.

VERBS. GLOSSARY.

retract	draw back or in: a plane retracting its landing gear.
fold	make compact by doubling or bending over parts
provide	make available; afford;
reduce	bring down, as in extent, amount, or degree; diminish
telescope	slide inward or outward in
put into service	begin to use something
meet demands	agree to do something that someone has requested

Exercise 1B.
Verbs. Find Synonyms.

retract; provide; fold; walk; reduce; telescope;
move back; travel; self-propelled movement; mobility; elongate;
shorten; recede; cut down; supply

Exercise 2B.
Answer the questions.

1. When was line of hydraulic telescopic-boom crawler cranes introduced in the USA?

2. What was the capacity of the earliest models of telescopic boom crawler cranes?

3. In what branches of industry were telescopic boom crawler cranes used due to their compact dimensions?

4. Where were telescopic boom crawler cranes used in eighties of the 20 the century?

5. In what branches of industry are telescopic boom crawler cranes used now?

Exercise 3B.
Describe the Mantis 3612. Use the following word-combinations

the most performance proven full-size telescopic boom crawler crane
meet the most severe of customer demands
rated at 18-tons capacity at a wide 12ft radius
the smallest model in the Mantis crane range
the great stability of this crane
due to extraordinarily low center-of-gravity
can even walk at full nominal capacity
with its tracks retracted for reduced width
can even walk with the boom partially telescoped
an alternative to Rough Terrain Crane
short setup times
flexible boom lengths
provide an excellent operational flexibility
can be retracted / folded to the chassis

TEXT C.DRAGLINE EXCAVATION SYSTEMS.

Read and translate.

Dragline excavation systems are heavy equipment used in civil engineering and surface mining In civil engineering the smaller types are used for road and port construction. The larger types are used in strip-mining operations to move overburden above coal, and for tar-sand mining. Draglines are amongst the largest mobile equipment.A dragline bucket system consists of

a large bucket which is suspended from a boom with wire ropes. The bucket is manoeuvred by means of a number of ropes and chains. The hoist rope, powered by large diesel or electric motors, supports the bucket and hoist-coupler assembly from the boom. The dragrope is used to draw the bucket assembly horizontally. By skillful manoeuvre of the hoist and the dragropes the bucket is controlled for various operations.

The construction industry rates dragline buckets in different types and classes. The types and classes are follows:

- Type I (light duty)
- Type II (medium duty)
- Type III (heavy duty)
- Class P (perforated plate)
- Class S (solid plate)

The dragline is a versatile attachment capable of a wide range of operations at and belowground level. The dragline can dig through loose to medium compacted soil. The biggest advantage of the dragline over other machines is its long reach for both digging and dumping.

Another advantage is its high cycle speed. The dragline does not have the positive digging force of the backhoe. The bucket is not weighted or held in alignment by rigid structures; therefore, it can bounce, tip over, or drift sideways when digging through hard materials. This weakness increases with digging depth.

Answer the questions:

What are the parts of dragline?

By what means is the bucket manoeuvred?

What is the hoist rope powered by?

What supports the bucket?

What are the advantages of the dragline?

What is the main weakness of the dragline?