

АНГЛИЙСКИЙ ЯЗЫК

**СБОРНИК ТЕКСТОВ
ПРОФЕССИОНАЛЬНОЙ НАПРАВЛЕННОСТИ И
УПРАЖНЕНИЙ ПО ГРАММАТИКЕ АНГЛИЙСКОГО
ЯЗЫКА ДЛЯ КУРСАНТОВ И СТУДЕНТОВ
СПЕЦИАЛЬНОСТИ 26.05.06 «ЭКСПЛУАТАЦИЯ
СУДОВЫХ ЭНЕРГЕТИЧЕСКИХ УСТАНОВОК»**

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ФЕДЕРАЛЬНОЕ АГЕНТСТВО МОРСКОГО И РЕЧНОГО ТРАНСПОРТА
КАСПИЙСКИЙ ИНСТИТУТ МОРСКОГО И РЕЧНОГО ТРАНСПОРТА
ИМЕНИ ГЕНЕРАЛ-АДМИРАЛА Ф.М. АПРАКСИНА
ФИЛИАЛ ФГБОУ ВО «ВОЛЖСКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ ВОДНОГО
ТРАНСПОРТА»

КАФЕДРА «ГУМАНИТАРНЫЕ ДИСЦИПЛИНЫ И АНГЛИЙСКИЙ ЯЗЫК»

Воронина Г.А.

АНГЛИЙСКИЙ ЯЗЫК

Сборник текстов профессиональной направленности и упражнений по
грамматике английского языка для курсантов и студентов специальности
26.05.06 «Эксплуатация судовых энергетических установок»

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Данный сборник предназначен для студентов 3-го курса специальности «Эксплуатация судовых энергетических установок».

Сборник по своему содержанию структурирован и состоит из 12 уроков (Units), каждый из которых включает в себя три раздела: Говорение (Speaking), Грамматика (Grammar) и тексты для дополнительного чтения (Supplementary reading), которые по тематике подобраны в соответствии с основной темой каждого урока.

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Введение

Сборник текстов и упражнений предназначен для аудиторной и самостоятельной работы курсантов и студентов по специальности «Эксплуатация судовых энергетических установок» очной и заочной форм обучения. Сборник включает темы (раздел Speaking), связанные с особенностью конструкции двигателя внутреннего сгорания, аутентичные инструкции по обслуживанию и ремонту, а также грамматический справочный материал (раздел Grammar) и упражнения на повторение основных временных форм активного и страдательного залога английского языка. Тексты сопровождаются глоссарием и вопросами, направленными на решение коммуникативных задач, а грамматические упражнения построены с учетом профессиональной лексики. В разделе Дополнительное чтение (Supplementary reading) представлены аутентичные статьи из периодических журналов для усовершенствования навыка чтения с целью извлечения профессионально полезной информации и подготовки к аннотированию по плану.

Сборник рассчитан на курсантов и студентов 3 курса, имеющих начальный языковой уровень знаний, а также минимальный профессиональный опыт работы в море и продолжающих изучение английского языка в ВУЗе. Учебный материал представлен в виде 12 уроков, тематика которых соответствует требованиям к обязательному минимуму содержания дисциплины «Иностранный язык (английский)» 5-6 семестры, входящей в основную образовательную программу подготовки специалистов по специальности 26.05.06 «ЭСЭУ».

UNIT 1

• <i>Grammar</i>	<i>PRESENT INDEFINITE TENSE. IMPERATIVE MOOD.</i>
• <i>Speaking</i>	<i>DIESEL ENGINE. TWO - STROKE ENGINE.</i>
• <i>Supplementary reading</i>	<i>TWO-STROKE SERIES FROM MAN</i>

GRAMMAR

PRESENT INDEFINITE TENSE

НАСТОЯЩЕЕ НЕОПРЕДЕЛЕННОЕ ВРЕМЯ

Настоящее неопределенное/простое время (Present Indefinite/Simple tense) используется при рассказе о событиях, которые происходят регулярно, а также при описании ситуаций, которые имеют место вообще, а не только в настоящий период времени. Чаще всего данное время употребляется со словами:

- *Usually*
- *Often*
- *Sometimes*
- *Every day*
- *Once a year*
- *In the morning*
- *Seldom*
- *Always*
- *Never*

Также время Present Indefinite употребляется для выражения:

- общеизвестных истин

The sun rises in the East. - Солнце встает на востоке.

The Neva flows into the Baltic Sea. - Нева впадает в Балтийское море.

- будущего действия с глаголами движения come, go, leave, start, arrive, depart (когда это действие осуществляется согласно расписания)

The plane leaves in 30 minutes.- Самолет отправляется через 30 минут.

Our ship comes to this port at 7 o'clock.- Наше судно прибывает в этот порт в 7 часов.

ОБРАЗОВАНИЕ ФОРМ PRESENT SIMPLE

УТВЕРДИТЕЛЬНАЯ ФОРМА

При образовании утвердительной формы предложения в Present Simple используется основная форма глагола (Infinitive). В 3-м лице единственного числа к основной форме глагола прибавляется окончание –s или –es.	I	work
	We	
	You	
	They	
	He	works
	She	
	It	

ВОПРОСИТЕЛЬНАЯ ФОРМА

При построении общего вопроса используется вспомогательный глагол do (does) в настоящем времени, который ставится перед подлежащим предложения.	Do	I	work?
		we	
		you	
		they	
	Does	he	work?
		she	
		it	

ОТРИЦАТЕЛЬНАЯ ФОРМА

Отрицательное предложение образуется при помощи вспомогательного глагола do (does) в настоящем времени, за которым следует отрицательная частица not.	I	do not	work.
	We	don't	
	You		
	They		
	He	does not	work.
	She	doesn't	
	It		

Examples

Утвердительная форма	I work on a tug. Pumps deliver water and fuel. He keeps watch every day.
Вопросительная форма	Do you work on a tug? Do pumps deliver water and fuel? Does he keep watch every day?
Отрицательная форма	I do not work on a tug. Pumps don't deliver water and fuel. He doesn't keep watch every day.

!!! Глагол to have в 3-м лице единственного числа имеет форму has.

I	• I have a certificate.	• У меня есть сертификат.
We	• We have a job.	• У нас есть работа.
You	• You have experience.	• У тебя есть опыт.
They	• They have problems with the HPFP.	• У них проблемы с ТНВД.
He	• He has instructions.	• У него есть инструкция.
She	• She has a family.	• У нее есть семья.
It	• The port has three tugs.	• В порту три буксира.

IMPERATIVE MOOD ПОВЕЛИТЕЛЬНОЕ НАКЛОНЕНИЕ

Повелительное наклонение употребляется для выражения повеления к действию, для выражения приказания или совета.

Глагол используется в основной (инфинитивной) форме; для отрицания употребляется вспомогательный глагол do not (don't).

Examples:

- Go there! Don't stay here.-Идите сюда! Не стойте здесь.
- Give it to me!-Дайте мне это!
- Stop smoking!-Прекратите курить!
- Adjust that pump!-Отрегулируйте тот насос!
- Don't clean the filter!- Не чистите фильтр!

Task 1

Fill in the gaps using the verb in brackets in Present Simple

1. My friend _____ on a ro-ro (work).
2. The Rules of the Sea _____ that safety at sea is very important (say).
3. I usually _____ a file and a hammer at my work (use).
4. The inlet valve _____ (open) before the exhaust valve _____ (close).
5. I _____ to finish this work in 20 minutes (hope).
6. The fuel injection valve _____ during the compression stroke (open).
7. They _____ to stop the engine as soon as possible (need)
8. I always _____ officer's commands (follow)
9. People _____ in the boiler -room (not, smoke).
10. A tanker _____ oil in tanks (carry).
11. Lubricating system _____ main and auxiliary engines (lubricate)
12. The pump _____ water (not, deliver).
13. Gas _____ during the exhaust stroke (exhaust).
14. We _____ the engine (not, start) if we _____ all systems before (not, check).
15. The piston _____ down (go).
16. We _____ the electrical motor (dismantle).
17. The ship's engine-room _____ in good condition (not, be).
18. We _____ to extinguish the fire (try).

Task 2

Make up the sentences using the model:

Model:

(he) grind exhaust/ inlet valves –

Does he grind exhaust or inlet valves?

He grinds inlet valves.

1. (You) work on a container/bulk carrier?
2. (pump system) provide sea water/fresh water for domestic use?
3. (we) drain all water/ some water from the engine?
4. (I) inspect indicator cocks/ fuel valves?
5. (this ship) go fast/slow?
6. (our vessel) arrive at a new port soon/ not very soon?
7. (they) close/ open safety valves?
8. (lubricating system) work well/badly?
9. (engineer) fill/drain fuel tanks?

Task 3

Make the questions using the words from the brackets

Model: I control bunkering operation (How often?) - How often do you control bunkering operation?

1. I finish this hot work (When?)
2. We need to wipe the pipes (Why?)
3. You often visit your friend in the city (Where?)
4. He comes into my cabin without permission (Who?)
5. Main turbines use steam from boilers (What?)
6. You keep watch every day (How often?)
7. We sail in the Pacific Ocean (Where?)
8. We have one main engine and two auxiliary engines in the engine-room (What else?)
9. My rank is the 3rd Engineer (What?)

Task 4

Translate from Russian into English using Imperative mood

1. Не наполняйте баки.	
2. Запустите воздушный компрессор.	
3. Закройте клапан.	
4. Не открывать клапан.	
5. Не чистить инжектор.	
6. Идти к двери.	
7. Заменить фильтр.	
8. Проверить показания измерительных приборов и записать их.	
9. Нажать на кнопку.	

10. Поддерживать оборудование в рабочем состоянии.	
11. Снять цилиндры крышки.	
12. Вынуть поршень.	
13. Разобрать турбоагрегат.	
14. Измерить давление топлива.	
15. Снять перчатки.	

SPEAKING

Study the following information

DIESEL ENGINE

INTERNAL COMBUSTION ENGINE is an engine in which fuel oil is burned directly within the working cylinder. Both gas and diesel engines are examples of internal combustion engines.

DIESEL ENGINE is an engine which uses a low grade oil for fuel and ignites it directly in the cylinder by the heat of air compression.

Remember the following words

Air compressor	воздушный компрессор
Air receiver	воздухосборник
Auxiliary engine	вспомогательный двигатель
Bearing	подшипник
Bilge	трюмная вода
Boiler	котел
Bunkering	бункеровка
Camshaft	распредвал
Combustion chamber	камера сгорания
Compression	сжатие, компрессия
Condition	состояние
Connection rod	шатун
Cooling system	охлаждающая система
Corrosive wear	коррозионный износ
Crack	трещина, щель
Crankcase	картер
Crankshaft	коленчатый вал
Cylinder liner	втулка цилиндра
Cylinder wall	стенка цилиндра
Damage	повреждение, поломка
Device	прибор
Emergency	авария, чрезвычайная ситуация
Equipment	оборудование
Exhaust valve	выхлопной клапан
Experience	опыт
Explosion	взрыв
Fault	дефект, неисправность
Feed water	питательная вода
Flame	пламя, огонь
Flame arrester	пламегаситель
Friction	трение
Fuel injection valve	топливно-инжекторный клапан
Gear	приспособление, устройство
Heat exchanger	теплообменник
Hose	шланг
Injector	инжектор, форсунка
Insufficient	недостаточный
Internal combustion	внутреннее сгорание

Leakage	течь, утечка
Level	уровень
Liquid	жидкость
Lubricating oil	смазочное масло
Machinery	машинное оборудование
Main engine	главный двигатель
Maintenance	техническое обслуживание
Manifold	коллектор
Manual	справочник, инструкция
Overheating	перегрев
Pipe	труба
Piston	поршень
Precaution	предосторожность
Pressure	давление
Pump	насос
Quality	качество
Quantity	количество
Readings	показания (приборов)
Relief valve	предохранительный клапан
Repair	ремонт
Responsibility	ответственность, обязанность
Safety	безопасность
Safety valve	предохранительный клапан
Scavenging air	продувочный воздух
Separator	сепаратор
Service tank	расходный бак
Sewage plant	установка для очистки сточных вод
Spare parts	запасные части
Spring	пружина
Stroke	такт, ход
Suction	всасывание
Supply	снабжение, поставка
Tank	цистерна, бак
Turbine	турбина
Turbocharger	турбокомпрессор
Valve	клапан
Viscosity	вязкость

Study the information below

2-STROKE ENGINE

TWO STROKES IN A TWO-CYCLE DIESEL ENGINE

1) One stroke compresses air in the cylinder to ignite the fuel oil.

2) Another stroke is produced by the burning gases. It is the power stroke.

Series of events in a two-stroke cycle diesel engine:

- air under light pressure is drawn into the cylinder and fills the cylinder through the open ports in the walls;
- the piston starts upward to compress the air to produce heat to ignite the fuel. The air is fully compressed and very hot;
- the fuel-injection valve opens and fuel oil is injected into the hot air where it ignites;
- the burning fuel forms gases which create pressure and send the piston downward; this is the power stroke.

(SUPPLEMENTARY READING)

Read the article taken from the journal *The Motorship insight for marine technology professionals*. Make a list of unknown words.

TWO-STROKE SERIES FROM MAN

19 Mar 2019

In a further phase of design optimisation of its two-stroke range, MAN Energy Solutions has unveiled Mark 10 versions of its G-type 800mm- and 600mm-bore engines, designated the G80ME-C10.5 and the G60ME-C10.5, respectively.

The company said that the engines will be ready for the new build market and its anticipated pick-up after 2020, “when the fuel oil situation is expected to be clearer, and the Energy Efficiency Design Index (EEDI) will require lower CO₂ emissions”.

The new iteration of the G80 utilizes the full Mark 10 design platform previously introduced with the G90ME-C10.5. The main result will be an advance in power density and efficiency. In the case of a seven-cylinder model, the weight reduction will be approximately 5%, and the specific fuel oil consumption(SFOC) will be lessened by 2g/kWh over the whole load range.

The reduced weight is attributable to the reduced cylinder distance enabled by the flexrod-type connecting rod, the flexible main bearing support, and the optimised cylinder frame. To cater for the increased maximum pressure, the G90ME-C10.5 incorporates the latest design of combustion chamber components adopted from the G95ME-C10.5, the most potent engine in MAN’s low-speed offering.

For a VLCC where a seven-cylinder G80ME-C10.5 has been nominated as the propulsion installation, and at a specified maximum continuous rating(SMCR) of 22,500kW, MAN calculates that the daily consumption at 100% load will be 86.3t, compared with 87.4t for the engine in its Mark 9 layout(G80ME-C9.5). Pre-supposing a US\$500 per tonne price tag for 0.5% very low Sulphur fuel oil (VLSFO), this would translate into a US\$531 per day fuel cost saving.

Depending on load and tuning solution, the G60ME-C10.5 will have a reduced SFOC of between 2.6 and 3.6g/kWh. The design is largely similar to the existing G60ME-C9.5, with the same outline, footprint, cylinder distance, and height of structural parts, so as to minimise the necessary changes in production and for ship installation. However, the uprated combustion pressures necessitate a review of the material, structure, and dimensions of moving parts and bearings as well as of the combustion chamber elements.

For a 2,500TEU intra-regional container vessel, where a six-cylinder G60ME-C10.5 main engine has been specified at an MCR of 12,400kW, MAN indicates a 42.2t/day daily fuel oil consumption at 90% load, as opposed to 43t/day for the Mark 9 version. This would suggest a US\$410 daily saving on the basis of 0.5% VLSFO priced at US\$500/tonne.

The first three models of the Mark 10 generation were announced in September 2016, as the G90ME-C10, S60ME-C10, and S70ME-C10 types, and were followed by the G95ME-C10. In each case, the latest variants have the C10.5 suffix. From the outset, the declared intention was to eventually upgrade all S- and G-engines to the Mark 10 platform.

Unit 2

• <i>Grammar</i>	<i>PRESENT CONTINUOUS TENSE</i>
• <i>Speaking</i>	<i>FOUR STROKES IN A FOUR-CYCLE DIESEL ENGINE</i>
• <i>Supplementary reading</i>	<i>WHY ARE 2-STROKE ENGINES USED MORE COMMONLY THAN 4-STROKE ON SHIPS?</i>

GRAMMAR PRESENT CONTINUOUS TENSE НАСТОЯЩЕЕ ПРОДОЛЖЕННОЕ ВРЕМЯ

Настоящее продолженное время используется при описании действия или события, которое разворачивается в момент речи или в настоящий период времени.

Present Continuous часто используется с такими наречиями и обстоятельственными выражениями, как:

- Today
- At the moment
- Now

Present Continuous также используется при:

- Обозначении событий, которые происходят часто и вызывают раздражение или удивление говорящего:

He is always shouting at me. – Он всегда кричит на меня.

She is always complaining. – Она всегда жалуется.

- Описание изменений:

The Universe is expanding. – Вселенная увеличивается в размерах.

The population of the Earth is increasing. – Население Земли увеличивается.

ОБРАЗОВАНИЕ ФОРМ PRESENT CONTINUOUS УТВЕРДИТЕЛЬНАЯ ФОРМА

Утвердительная форма предложения в Present Continuous образуется путем прибавления к вспомогательному глаголу to be (am, is, are) в настоящем времени причастия (-ing) смыслового глагола	I	Am	working.
	He	is	
	She		
	It		
	We	are	
	You		
	They		

ВОПРОСИТЕЛЬНАЯ ФОРМА

При построении общего вопроса вспомогательный глагол to be (am, is, are) ставится перед подлежащим предложения.	Am	I	working?
	Is	he	
		she	
		it	
	Are	we	
		you	
		they	

ОТРИЦАТЕЛЬНАЯ ФОРМА

Отрицательное предложение образуется путем прибавления к вспомогательному глаголу to be (am, is,are) отрицательной частицы not.	I	am not	working.
	He	is not	
	She		
	It		
	We	are not	
	You		
	They		

Present Continuous практически не используется с глаголами, выражающими состояние и чувства: like, love, hate, know, need, want, desire, wish, believe, suppose, remember, depend, etc.

Examples:

Утвердительная форма	I am keeping watch now. He is reading manuals. They are repairing a generator.	Сейчас я несую вахту. Он читает инструкции. Они ремонтируют генератор.
Вопросительная форма	Am I keeping watch now? Is he reading manuals? Are they repairing a generator?	Я несую вахту сейчас? Он читает инструкции? Они ремонтируют генератор?
Отрицательная форма	I am not keeping watch now. He is not reading manuals. They are not repairing a generator.	Сейчас я не несую вахту. Он не читает инструкции. Они не ремонтируют генератор.

Task 1

Use the model and make up sentences describing what is happening now. Translate the sentences into Russian.

Model: I/work/on this ship - I am working on this ship.

1. I/sit/in the control-room.
2. He/weld/a pipe.
3. You/keep/ watch.
4. They/ dismantle/the motor.

5. I/learn/new English words.
6. I/try to connect/these two cables.
7. We/overhaul/ the main engine.
8. He/tighten/the cover with screws.
9. Motormen/disjoint/the fuel injection valves.
10. AB seaman/grind/the surface before painting.

Task 2

Fill in the gaps using the words in brackets in the proper Tense form (Present Simple or Present Continuous)

1. What's the matter? Why...this motorman.....(not, work)?
2. Our ship seldom...at this port (call).
3. Go and help them. They...the cylinder cleaning (finish).
4. Where is the Second Engineer? He... the boiler (repair).
5. It's night and we ...(sleep).
6. Water... around the system (circulate).
7. What... you...there? (do) We ... the moter (repair).
8. During every watch a motorman... the operation of all equipment (check). At the moment he... it again (check).
9. ... the cargo from here (move).
10. Lubricating oil ... all moving parts of mechanism to avoid friction (lubricate).
11. The engine personnel ... for the overhaul (get ready)
12. ...your watch without my permission (not, leave).
13. The bosun always ... to new seamen their work (explain)
14. When there ...fire (be), at first we ... a fire extinguisher (use) and if it ... (not, help) we... CO₂ system (start).

Task 3

Fill in the gaps using the verbs from the box in Present Simple or Present Continuous Tense

lift, use, plan, need, clean, stop, take out, drain, be, prepare, fix, push, work, go, want, lubricate.

1. AB seamen ...the deck at the moment.
2. It's cargo loading operation and one of the cranes ... cargo onboard.
3. The Chief Engineer ...to overhaul the main engine next month.
4. The mooring winch... badly and our Master ...very angry.
5. The motorman ... the reciprocating pump right now.
6. They... ligeboats for launching to save the man overboard.
7. I... to assemble the centrifugal separator now.

8. The piston...exhaust gases out of the cylinder.
9. ... the main engine immediately!
10. They ... the piston rings at the moment.
11. I often ... a spanner.
12. The auxiliary engine ... overhaul.
13. The wiper ... the manifold now.
14. Lube oil... all rotating parts of the engine.
15. Where... you...?

SPEAKING

Study the following information

FOUR STROKES IN A FOUR-CYCLE DIESEL ENGINE

Intake stroke supplies air into the cylinder	intake stroke	такт впуска
Compression stroke compresses air by upward motion of the piston.	compression stroke	такт сжатия
Power stroke: mixed hot air and fuel produce power by the burning gases.	power stroke	рабочий ход
Exhaust stroke releases product of combustion	exhaust stroke	такт выпуска

Make use of the vocabulary and study the text below:

Series	последовательность
Event	событие
Inlet valve	впускной клапан
To draw	затягивать, тащить
Downward	вниз
Upward	вверх
To compress	сжимать
To produce	производить, изготавливать
To inject	впрыскивать
To ignite	зажигать, воспламенять
Burning	горящий
To form	формировать, организовывать
To create	создавать
To complete	завершать, заканчивать
To escape	избегать

Series of events in a cylinder of a four-stroke cycle engine:

- the inlet air valve opens and air is drawn into the cylinder by the downward stroke of the piston;
- the valve is closed, the piston starts upward and compresses the air to produce the heat that is needed to ignite the fuel;
- the fuel-injection valves open and the fuel oil is injected into the hot air where it ignites.
- the burning fuel forms gases which create pressure and send the piston downward; this is the power stroke of the engine;
- when the piston completes its power stroke, the exhaust valve opens and permits the burned gases to escape;
- the piston returns upward and forces the remaining gases out of the cylinder. The exhaust

- valve closes and the cycle repeats.

SUPPLEMENTARY READING

Read the article and answer the following questions after reading:

- *What advantages does the 4 stroke engine offer?*
- *Why are 4 stroke engines less popular than 2 stroke engines?*

Why are 2-stroke Engines Used More commonly than 4-stroke on Ships?

Last updated on October 18, 2019

When a ship is being constructed in a shipyard, the most important machinery that is to be selected is the main propulsion machinery. Both 2 stroke and 4 stroke engines are widely available in the market but for a large ocean-going merchant vessel, a 2 stroke engine is more commonly used as the main engine and has a much better market.

Even with a wide variety of advantages that 4 stroke engine offers like the compact size of the plant, much more RPM or speed etc, a 2 stroke engine outshines with few but vital advantages.

Some of the important reasons why 2 stroke engines are more popular than 4 stroke engines as main propulsion engine on ships

- **Fuel Selection:** The fuel prices have gone sky high and better grade fuel is adding higher costs to vessel operation. A two-stroke engine can burn low-grade fuel oil and hence reduce the running cost of the ship.
- **Efficiency:** The thermal and engine efficiency of 2 stroke engine is much better than that of a 4 stroke engine.
- **Power:** Most of the 2 stroke engines are now large stroke engines that produce more power. Hence they have high power to weight ratio as compared to 4 stroke engine.
- **More Cargo:** Ship can carry more weight and hence more cargo with 2 stroke engines because of high power to weight ratio.
- **Reliability:** Two stroke engines are more reliable in operation as compare to 4 stroke engine.
- **Less Maintenance:** The maintenance requirement of the two-stroke engine is much lesser than 4 stroke engine.
- **Direction control:** Direct starting and reversing is easier with two stroke engine.
- **No reduction attachments:** As two stroke engines are low speed engine, there is no requirement of reduction gear or speed reduction arrangement as required for high speed four stroke engine.

However, the ease-of-maneuvering a two stroke engine is less than that of a four stroke engine and the initial cost of installation of a two stroke propulsion plant is also much higher than running and maintenance cost of a 4 stroke engine. In 2 stroke engine, the amount saved on high grade fuel can compensate all other disadvantages and also reduce the whole operating cost of a ship.

[\(from https://www.marineinsight.com/\)](https://www.marineinsight.com/)

Unit 3

• <i>Grammar</i>	<i>PAST SIMPLE</i>
• <i>Speaking</i>	<i>STRUCTURAL PARTS OF A DIESEL ENGINE</i>
• <i>Supplementary reading</i>	<i>HOW AND WHERE SHIP'S ENGINE IS MADE.</i>

GRAMMAR

PAST SIMPLE

ПРОШЕДШЕЕ НЕОПРЕДЕЛЕННОЕ ВРЕМЯ

Прошедшее неопределенное время употребляется при описании действия или положения дел, имевшего место в некоторый определенный момент или некоторый период времени в прошлом. При этом обычно не является важным, как долго разворачивалось действие или событие. Существенно, что событие произошло в прошлом и не имеет связи с настоящим. В принципе, указание на определенный момент или отрезок времени не является обязательным, если из предшествующего контекста ясно, когда имело место событие.

Past Simple часто используется в сочетании с такими обозначениями времени как:

- Yesterday
- The day before yesterday
- Two days ago
- Last summer
- In 2005
- Last year
- Last week

ОБРАЗОВАНИЕ ФОРМ PAST SIMPLE

УТВЕРДИТЕЛЬНАЯ ФОРМА

Утвердительная форма предложения образуется путем прибавления к инфинитиву глагола окончания -ed (или используется II форма неправильных глаголов)	I	We	worked
	You	You	
	He	They	
	She It		

ВОПРОСИТЕЛЬНАЯ ФОРМА

При построении общего вопроса используется вспомогательный глагол - did , который ставится перед подлежащим предложения.Смысловой глагол при этом употребляется в своей основной форме.	Did	I	we	work?
		you	you	
		he she it	they	

ОТРИЦАТЕЛЬНАЯ ФОРМА

Отрицательное предложение образуется при помощи вспомогательного глагола – did , за которым следует отрицательная частица not . Смысловой глагол при этом употребляется в своей основной форме.	I	We	did not didn't	work.
	You	You		
	He She It	They		

Examples:

Утвердительная форма	<ul style="list-style-type: none"> I had breakfast in the morning. We went to Italy last year. They arrived at the airport at 5 pm. 	<ul style="list-style-type: none"> Я позавтракал утром. Мы ездили в Италию в прошлом году. Они приехали в аэропорт в 5 часов вечера.
Вопросительная форма	<ul style="list-style-type: none"> Did I have breakfast in the morning? Did he go to Italy last year? Did they arrive at the airport at 5 pm? 	<ul style="list-style-type: none"> Я позавтракал утром? Он ездил в Италию в прошлом году? Они приехали в аэропорт в 5 часов вечера?
Отрицательная форма	<ul style="list-style-type: none"> I didn't have breakfast in the morning. He didn't go Italy last year. They didn't arrive at the airport last year. 	<ul style="list-style-type: none"> Я не позавтракал утром. Он не ездил в Италию в проглом году. Они не приехали в аэропорт в прошлом году.

!!! Глагол to be в прошедшем времени имеет форму was/were. На него не распространяется общее правило построения отрицательных и вопросительных предложений, те есть при употреблении глагола to be в простом прошедшем времени вспомогательный глагол did не используется.

Example:

Предложение	Утвердительная форма	Вопросительная форма	Отрицательная форма
На том балкере он был вторым механиком	He was the Second Engineer on that bulker.	Was he the Second Engineer on that bulker?	He was not the Second Engineer on that bulker.

!!! Исключение также составляют неправильные глаголы, которые не подчиняются общему правилу добавления окончания –ed. Их форму нужно заучивать.

Таблица неправильных глаголов

Infinitive	Past simple	Past participle	Перевод
be [bi:]	was [wɒz], were [wɜ:]	been [bi:n]	быть
beat [bi:t]	beat [bi:t]	beaten ['bi:tn]	бить
become [bi:kʌm]	became [bi:keim]	become [bi:kʌm]	становиться
begin [bi'gin]	began [bi'gæn]	begun [bi'gʌn]	начинать
bleed [bli:d]	bled [bled]	bled [bled]	кровоточить
blow [blou]	blew [blu:]	blown [bloun]	дуть
break [breik]	broke [brɒk]	broken ['brɒk(e)n]	ломать
bring [briŋ]	brought [brɔ:t]	brought [brɔ:t]	приносить
build [bild]	built [bilt]	built [bilt]	строить
burn [bɜ:n]	burnt [bɜ:nt]	burnt [bɜ:nt]	гореть
burst [bɜ:st]	burst [bɜ:st]	burst [bɜ:st]	разразиться
buy [bai]	bought [bɔ:t]	bought [bɔ:t]	покупать
catch [kætʃ]	caught [kɔ:t]	caught [kɔ:t]	ловить, хватать
choose [tʃu:z]	chose [tʃəuz]	chosen [tʃəuz(ə)n]	выбирать
come [kʌm]	came [keim]	come [kʌm]	приходить
cost [cɒst]	cost [cɒst]	cost [cɒst]	стоить
creep [kri:p]	crept [krept]	crept [krept]	ползать
cut [kʌt]	cut [kʌt]	cut [kʌt]	резать
do [du:]	did [did]	done [dʌn]	делать
draw [drɔ:]	drew [dru:]	drawn [drɔ:n]	рисовать, тащить
dream [dri:m]	dreamt [dremt]	dreamt [dremt]	мечтать, дремать
drink [driŋk]	drank [dræŋk]	drunk [drʌŋk]	пить
drive [draiv]	drove [drouv]	driven ['drivn]	водить
eat [i:t]	ate [et]	eaten ['i:tn]	есть
fall [fɔ:l]	fell [fel]	fallen ['fɔ:lən]	падать
feed [fi:d]	fed [fed]	fed [fed]	кормить
feel [fi:l]	felt [felt]	felt [felt]	чувствовать
fight [fait]	fought [fɔ:t]	fought [fɔ:t]	бороться
find [faɪnd]	found [faund]	found [faund]	находить
fit [fit]	fit [fit]	fit [fit]	подходить по размеру

fly [flai]	flew [flu:]	flown [floun]	летать
forget [fə'get]	forgot [fə'gɒt]	forgotten [fə'gɒt(ə)n]	забывать
forgive [fo'giv]	forgave [fo'geiv]	forgiven [fo'givn]	прощать
freeze [fri:z]	froze [frouz]	frozen ['frouzn]	замерзать
get [get]	got [gɒt]	got [gɒt]	получать
give [giv]	gave [geiv]	given [givn]	давать
go [gou]	went [went]	gone [gɒn]	идти
grow [grou]	grew [gru:]	grown [groun]	расти
hang [hæŋ]	hung [hʌŋ]	hung [hʌŋ]	вешать
have [hæv]	had [hæd]	had [hæd]	иметь
hear [hiə]	heard [hɜ:d]	heard [hɜ:d]	слышать
hide [haid]	hid [hid]	hidden ['hidn]	прятать
hit [hit]	hit [hit]	hit [hit]	попадать в цель
hold [hould]	held [held]	held [held]	держать
hurt [hɜ:t]	hurt [hɜ:t]	hurt [hɜ:t]	ушибить
keep [ki:p]	kept [kept]	kept [kept]	содержать
kneel [ni:l]	knelt [nelt]	knelt [nelt]	стоять на коленях
know [nou]	knew [nju:]	known [noun]	знать
lay [lei]	laid [leid]	laid [leid]	класть
lead [li:d]	led [led]	led [led]	вести
lean [li:n]	leant [lent]	leant [lent]	наклоняться
learn [lɜ:n]	learnt [lɜ:nt]	learnt [lɜ:nt]	учить
leave [li:v]	left [left]	left [left]	оставлять
lend [lend]	lent [lent]	lent [lent]	занимать
let [let]	let [let]	let [let]	позволять
lie [lai]	lay [lei]	lain [lein]	лежать
light [lait]	lit [lit]	lit [lit]	освещать
lose [lu:z]	lost [lɒst]	lost [lɒst]	терять
make [meik]	made [meid]	made [meid]	производить
mean [mi:n]	meant [ment]	meant [ment]	значить
meet [mi:t]	met [met]	met [met]	встречать
mistake [mis'teik]	mistook [mis'tuk]	mistaken [mis'teik(e)n]	ошибаться
pay [pei]	paid [peid]	paid [peid]	платить
prove [pru:v]	proved [pru:vd]	proven [pru:vn]	доказывать
put [put]	put [put]	put [put]	положить
quit [kwit]	quit [kwit]	quit [kwit]	выходить
read [ri:d]	read [red]	read [red]	читать
ride [raid]	rode [roud]	ridden ['ridn]	ездить верхом
ring [riŋ]	rang [ræŋ]	rung [rʌŋ]	звенеть
rise [raiz]	rose [rouz]	risen ['rizn]	подниматься
run [rʌŋ]	ran [ræŋ]	run [rʌŋ]	бежать

say [sei]	said [sed]	said [sed]	говорить
see [si:]	saw [sɔ:]	seen [si:n]	видеть
seek [si:k]	sought [sɔ:t]	sought [sɔ:t]	искать
sell [sel]	sold [sould]	sold [sould]	продавать
send [send]	sent [sent]	sent [sent]	посылать
set [set]	set [set]	set [set]	ставить
sew [sou]	sewed [soud]	sewn [soun]	шить
shake [ʃeik]	shook [ʃuk]	shaken [ˈʃeik(ə)n]	встряхивать
show [ʃəu]	showed [ʃəud]	shown [ʃəun]	показывать
shrink [ʃrɪŋk]	shrank [ʃræŋk]	shrunk [ʃrʌŋk]	уменьшать
shut [ʃʌt]	shut [ʃʌt]	shut [ʃʌt]	закрывать
sing [sɪŋ]	sang [sæŋ]	sung [sʌŋ]	петь
sink [sɪŋk]	sank [sæŋk], sunk [sʌŋk]	sunk [sʌŋk]	тонуть
sit [sit]	sat [sæt]	sat [sæt]	сидеть
sleep [sli:p]	slept [slept]	slept [slept]	спать
slide [slaid]	slid [slid]	slid [slid]	скользить
sow [sou]	sowed [soud]	sown [soun]	сеять
speak [spi:k]	spoke [spouk]	spoken [ˈspouk(e)n]	говорить
spell [spel]	spelt [spelt]	spelt [spelt]	произносить по буквам
spend [spend]	spent [spent]	spent [spent]	тратить
spill [spil]	spilt [spilt]	spilt [spilt]	проливать
spoil [spɔil]	spoilt [spɔilt]	spoilt [spɔilt]	портить
spread [spred]	spread [spred]	spread [spred]	расстилать
spring [sprɪŋ]	sprang [spræŋ]	sprung [sprʌŋ]	прыгать
stand [stænd]	stood [stu:d]	stood [stu:d]	стоять
steal [sti:l]	stole [stoul]	stolen [ˈstəulən]	красть
stick [stik]	stuck [stʌk]	stuck [stʌk]	колоть
sting [stɪŋ]	stung [stʌŋ]	stung [stʌŋ]	жалить
sweep [swi:p]	swept [swept]	swept [swept]	выметать
swell [swel]	swelled [sweld]	swollen [ˈswoul(e)n]	разбухать
swim [swim]	swam [swem]	swum [swʌm]	плавать
swing [swɪŋ]	swung [swʌŋ]	swung [swʌŋ]	качать
take [teik]	took [tuk]	taken [ˈteik(ə)n]	брать, взять
teach [ti:t]	taught [tɔ:t]	taught [tɔ:t]	учить
tear [tɛə]	tore [tɔ:]	torn [tɔ:n]	рвать
tell [tel]	told [tould]	told [tould]	рассказывать
think [θɪŋk]	thought [θɔ:t]	thought [θɔ:t]	думать
throw [θrəu]	threw [θru:]	thrown [θrəun]	бросать
understand [ʌndə'stænd]	understood [ʌndə'stud]	understood [ʌndə'stud]	понимать
wake [weik]	woke [wouk]	woken [ˈwouk(e)n]	просыпаться
wear [weə]	wore [wɔ:]	worn [wɔ:n]	носить

weep [wi:p]	wept [wept]	wept [wept]	плакать
wet [wet]	wet [wet]	wet [wet]	мочить
win [win]	won [wʌn]	won [wʌn]	выигрывать
wind [waɪnd]	wound [waʊnd]	wound [waʊnd]	извиваться
write [raɪt]	wrote [raʊt]	written ['rɪtn]	писать

Task 1

Read and understand the text, choose the verbs in Past Simple

Nov. 24, 2008 – We had two serious incidents on a chemical tanker. All circumstances are not clear yet. One crewmember ignored company procedures and onboard safety warnings. He entered a cargo tank during cleaning procedure. Another crewmember warned him not to enter because there was insufficient oxygen and he didn't have a breathing apparatus. But he went in anyway. One of crewmembers put on a breathing apparatus and went in to get him out. But his mask was removed for some reason. The alarm was started and proper rescue operation was carried out but two seaman died.

As you all know, this is the most common cause of death at sea but some people don't get their lessons. Bring this to the attention of all onboard and explain what can happen if they don't follow basic safety procedures.

Task 2

Fill in the gaps using the verbs from the box in Past Simple

go, watch, call, visit, start, keep, lubricate, close, finish, explain, measure, be

1. Yesterday evening I... TV.
2. I ... to the bridge to bring the message to the Chief Officer two hours ago.
3. We ...washing at 10 o'clock and ... at 12 o'clock.
4. I ... the hatch cover last week.
5. Last Saturday we ... Hong Kong.
6. I ... watch three times last week.
7. The Chief Engineer ... to me my duties very well the day before yesterday.
8. I ... home a week ago.
9. The fuel oil service tanks ...full.
10. We.... the bearings in the manoeuvring mechanism.
11. He ... fuel oil pressure in the engine.

Task 3

Translate the sentences from Russian into English using Past Simple tense.

Sentences in Russian	Sentences in English
1. Матросы вошли в кают - компанию с разрешения капитана.	
2. Мы посетили Испанию и Италию.	
3. Танкер взял 40 тонн воды.	
4. Мы не отремонтировали ту крышку вчера.	
5. Ты поговорил со стармехом на прошлой недели?	
6. Капитан повторил свой приказ после обеда.	
7. Мы проверили давление топлива.	
8. Компания обеспечила вас инструкциями по обслуживанию двигателей?	
9. Они не нашли трещин в поршне.	
10. Трение уменьшилось.	
11. Давление в трубе повысилось до опасного уровня.	
12. Он закончил сварочные работы на палубе.	
13. Вы закрыли клапана?	
14. Мы осмотрели новое оборудование и не нашли никаких повреждений.	
15. Он не забыл измерить температуру в цилиндре.	
16. Груз был загружен в трюмы.	
17. Охлаждающая система не работала час назад.	

SPEAKING

STRUCTURAL PARTS OF A DIESEL ENGINE

Read and translate the text, pay attention to the words below:

cylinder block	блок цилиндров
crankcase	картер
bedplate	фундаментальная рама
oil sump	маслосборник
hold	держать
remote	удаленный
rigidity	жесткость
gear	привод, устройство, механизм
blower	вентилятор
connecting rod	шатун
handwheel	маховик
gasket	прокладка, набивка, сальник
stud	шпилька, распорка
rocker arm	качающийся рычаг, радиальная спица траверсы

The principal components of an internal combustion engine may be divided into two principal groups-parts and systems. The main parts of an internal combustion engine may be further divided into structural parts and moving parts.

The frame of the modern diesel may include such parts as the cylinder block, crankcase, bedplate or base, sump or oil pan and end plates.

The engine frame part which supports the engine's cylinder liners and cylinder heads is called the cylinder block.

The engine frame part, which serves as a housing for the crankshaft, is called the crankcase.

In large engines of early design the support for the main bearings was provided by a bedplate. In some large engines of more modern design the support for main bearings is provided by a part called the base.

Since lubrication is essential for proper engine operation, a reservoir for collecting and holding the engine's lubricating oil is a necessary part of the engine structure. The reservoir may be called a sump or an oil pan, depending upon its design and is usually attached directly to the engine. However, in some engines, the oil reservoir may be located at some point relatively remote from the engine; such engines may be called dry sump engines.

Some engines have flat steel plates attached to each end of the cylinder block. End plates add rigidity to the block and provide a surface to which may be bolted housings for such parts as gears, blowers, pumps and generators.

Many engines, especially the large ones, have access openings in some parts of the engine frame. These openings permit access to the cylinder liners, main and connecting rod bearings, injector control shafts and various other internal engine parts. Access doors (sometimes called covers or plates) for the openings are usually secured with handwheel or nut-operated clamps and are fitted with gaskets to keep dirt and foreign material out of the engine's interior.

The cylinder assembly consists of the head, the liner, the studs and the gasket; it provides a gas and liquid -tight space. Practically all diesel engines are constructed with replaceable cylinder liners. The liners or bores must be sealed tightly to form the combustion chambers. The space at the combustion end of a cylinder is formed and sealed by a cylinder head, which is a separate unit from the block.

A number of engine parts, which are essential to engine operation, may be found in or attached to the cylinder head. The cylinder head may house intake and exhaust valves, valve guides and valve seats. Rocker arm assemblies are frequently attached to the cylinder head.

The fuel injection valve is almost always in the cylinder head. Cylinder heads of a diesel engine may also be fitted with air starting valves, indicator and blow down valves and safety valves. Large diesel engines generally have one cylinder head for each cylinder.

In most cases the seal between the cylinder head and the block depends principally upon the studs and gaskets. The studs or stud bolts secure the cylinder head to the cylinder block. A gasket between the head and the block is compressed to form a seal when the head is properly tightened down.

Task 4

Answer the questions and check your comprehension of the text

1. What structural parts does the engine frame include?
2. What portion of the frame is called the crankcase?
3. What parts may provide the support for the main bearings?
4. What do we call the reservoir that holds the lube oil collected in the lower part of some engines?
5. Can you explain the term “ dry sump engine”?
6. What is the double function of the end plates?
7. What arrangements make the examination of the bearing and other internal parts of a diesel engine possible?
8. What is a gasket?
9. What are the parts of the cylinder assembly? Are all of them replaceable?
10. What valves may be fitted in the cylinder head?
11. Are rocker arm assemblies attached to the cylinder heads of all types of diesel engine?

SUPPLEMENTARY READING

Read the article and make a list of unknown vocabulary

How and where ship's engine is made.

If you have seen engines on ships, including small 4 stroke generator engines and also the massive 2 stroke propulsion engines, one thought which must have crossed your mind is how and where these engines were made?

The most famous engine manufacturers, whose engines, are used in ships are:

1. MAN Diesel & Turbo (Previously B&W engines) – famous for high, medium and slow speed marine engines
 2. Wartsila (Previously Sulzer Engines) – famous for high, medium and slow speed marine engines
 3. Mitsubishi – producing engines for light, medium, and heavy-duty applications
 4. Rolls Royce – famous for the cruise ship and naval ship engines
 5. Caterpillar manufactures – for medium speed and high-speed marine diesel engines
- Wartsila is still the Guinness World Record holder for the largest ship engine ever built.

The Wärtsilä RT-flex96C two-stroke engine fitted with turbocharger holds this record. Manufactured for large container ships, its dimensions are as follows:

Length – 27 metres (88 ft 7 in),

Height- 13.5 metres (44 ft 4 in)

Weight > 2,300 tonnes.

Power output~ 84.42 Megawatts (114,800 bhp).

The size of the ship engine varies from ship to ship, type of stroke it has, and its power output. The ship engine can be as high as a 5 story building, and to accommodate it, the ship engine room has to be designed accordingly.

Where are marine engines made?

These marine engines are built at the facilities of the manufacturers. For e.g. MAN Diesel has production facilities in Augsburg, Copenhagen, Saint-Nazaire, Shanghai, etc.

Similarly, Wartsila has facilities in Finland, Germany, China etc.

The ship's engine can also be made in reputed shipyard if there is a contract between the engine is usually made in three different sections and depending upon the size of the engine room and access for the installation, it can be fitted in the shipyard either in sections or as an entire assembly.

Material Used For Making Ship Engine

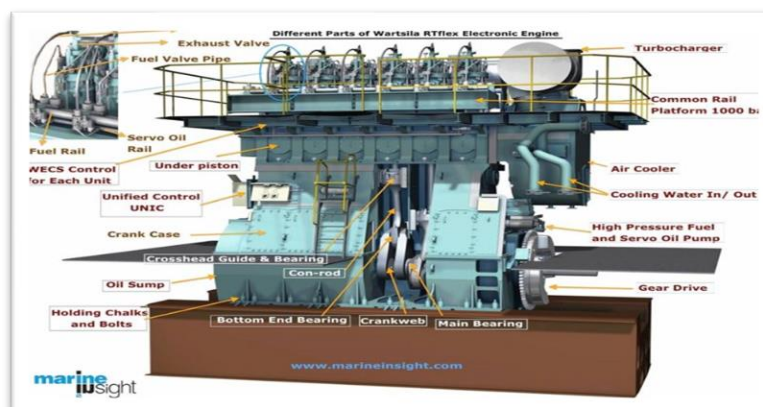
The material used for making the ship's engine and different ship engine parts are:

Bedplate: The bedplate is the bottom-most portion of the engine which is the base of the engine and accommodates crankshaft bearings and A-frame. For the small engine, a single casting of cast iron is used and for large 2 stroke engines, fabricated cast steel transverse sections with longitudinal girders are used.

A frame: The A-frame, as the name suggests, is similar to the shape of letter 'A' and is installed above the bedplate of the engine. It is built separately to carry the crosshead guide and on top, it supports the base of the entablature. The bottom surface of the A-frame is machined for making a mating surface to install on top of the bedplate.

Entablature: The entablature, also known as cylinder block, is made from cast iron and used to accommodate the cooling water and scavenge airspace. Depending upon the size of the engine, the casting can be either for individual or multicylinder (bolted together). The lower portion of the cylinder block is machined to form a mating surface and fastened with the A-frame using fitted bolts.

The other different ship engine parts which are fitted inside the engine are: Piston, liner, cylinder, connecting rod, crankshaft, camshaft, fuel pump, exhaust valve, etc.



(from <https://www.marineinsight.com/main-engine/how-ships-engine-works/>)

Unit 4

• <i>Grammar</i>	<i>PAST CONTINUOUS</i>
• <i>Speaking</i>	<i>MOVING PARTS OF A DIESEL ENGINE</i>
• <i>Supplementary reading</i>	<i>HOW MASSIVE MAIN ENGINES ARE FITTED IN THE SHIP'S ENGINE ROOM.</i>

GRAMMAR

PAST CONTINUOUS

ПРОШЕДШЕЕ ПРОДОЛЖЕННОЕ ВРЕМЯ

Прошедшее продолженное время используется для выражения действия или события, происходящего в определенный момент в прошлом. Это действие или событие уже началось, но еще не закончилось в прошлом.

ОБРАЗОВАНИЕ ФОРМ PAST CONTINUOUS

УТВЕРДИТЕЛЬНАЯ ФОРМА

Утвердительная форма предложения образуется при помощи вспомогательного глагола to be в прошедшем времени – was/were и причастия прошедшего времени –ing смыслового глагола (Infinitive)	I	was	working
	He, She, It		
	We	were	
	You		
	They		

ВОПРОСИТЕЛЬНАЯ ФОРМА

При построении общего вопроса вспомогательный глагол to be в <u>прошедшем времени-was/were</u> ставится <u>перед подлежащим</u>	Was	I	<u>working?</u>
		<u>he, she, it</u>	
	Were	<u>we</u>	
		<u>you</u>	
		<u>they</u>	

ОТРИЦАТЕЛЬНАЯ ФОРМА

Отрицательная форма образуется путем прибавления к вспомогательному глаголу to be в прошедшем времени – was/were отрицательной частицы not.	I	was not	working.
	He, She, It		
	We	were not	
	You		
	They		

Examples:

Утвердительная форма	<ul style="list-style-type: none"> • He was starting the fire pump when the alarm sounded. • They were checking extinguishers from 2 till 2:30 pm. 	<ul style="list-style-type: none"> • Когда прозвучала сирена, он запускал пожарный насос. • Они проверяли огнетушители с 14 до 14:30.
Вопросительная форма	<ul style="list-style-type: none"> • Was he starting the fire pump when the alarm sounded? • Were they checking extinguishers from 2 till 2:30 p.m.? 	<ul style="list-style-type: none"> • Когда прозвучала сирена, он запускал пожарный насос? • Они проверяли огнетушители с 14 до 14:30?
Отрицательная форма	<ul style="list-style-type: none"> • He was not starting the fire pump when the alarm sounded. • They were not checking extinguishers from 2 till 2:30 p.m. 	<ul style="list-style-type: none"> • Он не запускал пожарный насос, когда прозвучала сирена. • Они не проверяли огнетушители с 14 до 14:30.

Прошедшее длительное время в английском зачастую применяется с распространенными словосочетаниями:

- all day long – весь день
- all the time — все время
- all day yesterday — вчера весь день
- the whole morning – целое утро
- from 5 till 7 p.m. – с 5 до 7
- at 5 o'clock yesterday

Применение When и While в Past Continuous

When и While переводятся на русский язык как «когда». Когда мы говорим о прошлом, после When ставится глагол, поставленный во временную форму Past Simple. После же while — форма past continuous. While применяется в значении «пока», «в то время как».

Example:

While I was keeping watch he didn't sleep. – Когда я нес вахту он не уснул.

I was keeping watch when the hose burst. – Я нес вахту, когда шланг порвался.

Прошедшее продолженное время применяется в тех случаях, когда речь идет о привычках, имеющих в прошлом у объекта повествования. Такие привычки могут быть нам неприятны, вызывают раздражение и негодование. В таких конструкциях можно встретить наречия constantly (постоянно), often (часто), always (всегда, постоянно).

Example:

- We were often being late for the watch because of you!

Также с always применяется данная временная форма для выражения многократно повторяющихся действий, которые надоели говорящему.

Example:

- He was always ringing me up after his work. Вечно он мне звонил после работы. (Надоел уже.)

Для сравнения: He always rang me up after his work. В данном случае мы употребили Past Simple, тем самым и изменили эмоциональную окраску. Теперь отношение говорящего к происходящему воспринимается им, как нечто, само собой разумеющееся, как явление, относящееся к нормальным. Перевод — Он всегда звонил мне после работы.

Task 1

Translate the sentences 1-10 from English into Russian and the sentences 11-16 from Russian into English

1. What were you doing at 10 o'clock last evening?	1
2. The pumpman was connecting the hose at the moment when I came in.	2
3. They were transferring old fuel into one tank to minimize mixing.	3
4. The motorman was adjusting the bearing from 6 till 8 o'clock two days ago.	4
5. We found out that high sulphur contents were causing the damage to the working parts of the engine.	5
6. I was making a spares list for the company in my cabin when the pirates attacked.	6
7. What were you doing at the end of June?	7
8. When I came into the Chief Engineer's cabin he was working on the computer.	8
9. I was cleaning the auxiliary boiler when the main engine was stopped.	9
10. He was still working when the clock showed 9 p.m.	10
11.	11. Он осматривал двигатель в течении получаса.
12.	12. Мы вчера вечером обсуждали условия бункеровки.
13.	13. Моторист устанавливал предохранительный клапан два дня назад.
14.	14. В это время вчера двигатель не работал.
15.	15. Воду откачивали из топливной системы позавчера весь вечер.
16.	16. Пока я осматривал машинное отделение, моторист снимал показания температур.

Task 2

Fill in the gaps using the verbs in brackets in proper tense forms

1. The Third Engineer ... the bunkering plan (prepare) when he ... the fire alarm (hear)
2. At 6 o'clock yesterday we ... (check) the quantity of the fuel oil.
3. They ...the fuel filters (clean) when I ... them (see).
4. He ... the piston rings on the second cylinder (renew) and... to his cabin (go).
5. The engine ...at slow speed the whole evening yesterday (work).
6. I... (not see) how he ...oil spills (clean).
7. Where ... you (to be) when the fitter (injure).
8. At that time the electrical engineer ... (hold) naked wires in his hands and... (receive) a considerable electric shock.

SPEAKING

MOVING PARTS OF A DIESEL ENGINE

Study the vocabulary

Open hearth steel	Мартеновская сталь
Customary =commonly	обычно
To build up	Составлять, собирать
Web	Мотылевая щека(плечо мотыля)
Crank pin	Шейка мотыля
Solid	Зд. Целиком
To bore	Растачивать, сверлить
Shrink (shrunk, shrunk)	Насаживать в горячем состоянии («на горячо»)
Rectangular	Прямоугольный
Foot	Нижняя часть, пята, опора
Crank pin box	Мотылевый подшипник
taper	сужаться
Crosshead pin box	Головной, мотылевый подшипник
To drill	Сверлить
To afford	Обеспечивать, предоставлять, давать
Wrist pin	Цапфа, палец крейцкопфа
Projecting	Выступающий
Fore side	Носовая (передняя)часть
Aft side	Кормовая (задняя) часть
Cast steel	Литая сталь
Shipper	Ползун, башмак
To secure	Крепить, закреплять
Stud	Шпилька
Hollow	Полый, пустотелый
As a means of	Как средство для
Lube oil= lubricating oil	Смазочное масло
Flange	Фланец
Trunk piston	Тронковый поршень
To perform	Выполнять, осуществлять
Gas tight	Газонепроницаемый, герметичный
Movable	Подвижный
Side thrust	Боковой упор, давление на
Proper	Зд. Сам, именно
Piston skirt	Юбка поршня
In the case of	В случае
Knuckle joint pipe	Шарнирная труба (труба с шарнирным соединением)

Read and translate the text

Diesel engine major moving parts are crankshaft, connecting rod, crosshead, piston rod, piston. Marine Diesel engine crankshaft are usually made of open hearth steel. For large engines it is customary to build up the crankshafts, each pair of webs with its crank pin being forged solid and the web forgings bored and shrunk on the shaft.

Standard type of connecting rod has a flanged out rectangular foot which rests on the top crank pin box and to which the box is bolted. It tapers slightly towards the top end and is there forked cut to form a support for the crosshead pin boxes. The rod is drilled its length to afford a passage for lubricating oil.

The marine type crosshead is a forged steel block with wrist pins projecting from the fore and aft sides. The block is bored to receive the end of the piston and the east steel slipper is secured to the block by through bolts or studs.

The piston rod may be solid but in some cases hollow rods are used as a means of getting cooling water or lube oil into and out of the piston. The upper end is formed into a flange for bolting to the upper side of the piston.

Piston in general may be divided into trunk and crosshead types.

A typical trunk piston length is slightly more than twice its diameter. The reason is that the piston is required to perform two major functions: to form a gas-tight and movable cylinder end and to transmit side thrust to the stationary part of the engine structure.

For the 2-cycle, crosshead type engine the piston is usually made in two parts: the prison proper and the skirt. The use of a long skirt on the piston is necessary to keep the exhaust and scavenging ports closed when the piston is in the upper part of the cylinder.

Pistons are cooled by oil or water and for this purpose the upper part of the prison is made in the form of a closed box. In the case of oil cooling the lubricating oil is used.

If water cooling is used or if the piston cooling oil is kept separate from the bearing oil, the cooling fluid is led into the piston through a telescopic or knuckle jointed pipe.

Answer the questions using the text:

1. What are the major moving parts of a Diesel engine?
2. What material are crankshafts usually made of?
3. What can you say about crank webs?
4. What kind of foot does a standard type connecting rod have and where does it rest?
5. For what purpose is the rod drilled through its length?
6. Where do the crosshead wrist pins project from?
7. What types of piston rods are used in marine practice?
8. What are the major functions performed by the piston?
9. Why is the use of a skirt on the piston necessary?
10. What is the piston cooled by?

SUPPLEMENTARY READING

How Massive Main Engines are Fitted in the Ship's Engine Room?

Last updated on November 8, 2019

A ship's main engine is a massive structure with an average height of about 3 to 4 storey building (approx. 45 feet) and weight equals to 500 giant African elephants (2500 tonnes). While installing a new main engine in the engine room, the procedure is divided into parts on the basis of different parts of the engine. The engine is installed in parts in the shipyard itself during the ship building process.

The enormous structure of the main engine consists of several moving parts (both rotating and reciprocating) which transmits the engine mechanical power to the propeller for moving the ship further.

As all the components of the main engine are under different forces, the engine must be secured to the ship firmly to avoid any damage due to excessive vibrations.

The main engine is fitted on the ship's hull with the help of holding down bolts and chocks. The floor where the engine is installed is excessively strengthened by heavy flooring and using additional bars and girders. The bedplate which is the base of the engine is attached by means of holding down bolts and chocks arrangement.

There are mainly two chock materials that are used to hold the main engine -

1. Cast steel Chock.
2. Epoxy resins Chock.

Cast steel chocks require expertise for installation and are expensive to use. In today's time, marine engine makers are recommending epoxy resin based chocks which do not require any special measures and are also cost effective.

Preparation and Installation of Marine Engine

While installing the engine, first the whole engine- its crankshaft, intermediate shaft and propeller shaft along with propeller are aligned in a straight line. This is done by following a brief procedure:

- Clear the area where chocks and holding down bolts are to be fitted.
- Prepare the chock well before time by mixing hardener and resin as required by the weight or volume ratio.
- All holes for bolts must be kept pre-drilled and bolts available but not be inserted.
- Prepare foam dam for chock's installation.
- Ensure there is no hot work going on nearby the operating place.
- The pouring temperature must be more than 25 °C. If less, heat the solution while pouring.
- Fit a holding bolt in the hole drilled and spray releasing agent chemical on them

- Pour resin mixture around the inserted bolt.
- Tighten the holding down bolt with the help of hydraulic jack at required pressure.
- Side chocks are fitted in line with main bearing girders.
- End chocks are fitted at aft and fore end to resist axial thrust from the propeller.

The dried up time of epoxy resins depends on the steel temperature which goes from no cure to a curing time of 48 hours.

- Deliver almost 100% contact even on a rough surface.
- Cheap installation and no special hands are required.
- Chemical resistant
- Non corrosive

Disadvantages:

- If engine is misaligned or chocks are incorrectly fitted, the overall life reduces.
- Over tightening or stressing of holding bolts may lead to chock damage.
- Maximum temperature of exposure is 80 °C.

The holding down bolts and chocks are very small components they must be inspected and checked regularly for tightness as loose bolts may lead to heavy engine vibration, misalignment, bearing damage, and even crankcase explosion.

(from <https://www.marineinsight.com/main-engine/how-massive-main-engines-are-fitted-in-the-ships-engine-room/>)

Unit 5

• <i>Grammar</i>	<i>PRESENT PERFECT TENSE</i>
• <i>Speaking</i>	<i>DIFFERENT TYPES OF MARINE ENGINE</i>
• <i>Supplementary reading</i>	<i>FIRST MHI-MME LOW-SPEED ENGINE ENTERS SERVICE</i>

GRAMMAR

PRESENT PERFECT TENSE

НАСТОЯЩЕЕ СОВЕРШЕННОЕ ВРЕМЯ

I have worked/done	I have not worked/done = I haven't done	Have I done?
You have worked/done	You have not worked/done = You haven't done	Have you done?
We have worked/done	We have not worked/done = We haven't done	Have we done?
They have worked/done	They have not worked/done = They haven't done	Have they done?
He has worked/done	He has not worked/done = He hasn't done	Has he done?
She has worked/done	She has not worked/done = She hasn't done	Has she done?
It has worked/done	It has not worked/done = It hasn't done	Has it done?

Настоящее совершенное время употребляется для обозначения действия или события, происходившего в прошлом и имеющего связь с настоящим, то есть являющегося актуальным, существенным, значимым для момента речи.

• I've broken my screwdriver. Can you give me another one. – Я сломал мою отвертку. Можешь ли ты дать мне другую.

• I've completed my work so I can help you with the repair of this pump. – Я завершил свою работу, поэтому могу помочь тебе с ремонтом этого насоса.

Present Perfect употребляют, когда хотят объявить нечто или сообщить о чем-то, что произошло только что или совсем недавно

• I've just dismantled this pump. – Я только что разобрал этот насос.

• The Chief Engineer hasn't received any telexes from the technical department lately. – Последнее время старший механик не получал телексов от технического департамента.

Настоящее совершенное время используется при обозначении события, которое рассматривается как факт жизни, из которого можно черпать жизненный опыт или делать умозаключение. То, когда именно произошло данное событие, неважно или неизвестно. Существенно, что событие вообще имело место.

• I've read this manual. – Я читал эту инструкцию

• I've never been to America. – Я никогда не был в Америке.

• Have you had such problems with the main engine? – У вас (вообще) были такие проблемы с главным двигателем?

Present Perfect употребляется с выражениями, обозначающими период времени, который к моменту речи еще не закончился, такими как:

- Today сегодня
- This week на этой недели
- This morning этим утром
- For 2 years последние два года
- This evening этим вечером
- So far до сих пор, пока

I have unbolted ten nuts today- Я открутил сегодня десять гаек.

I haven't seen him for ten years.- Я не видел его десять лет.

Настоящее совершенное время используется с наречиями:

- *Lately* недавно
- *Recently* недавно
- *Just* только что
- *Never* никогда
- *Yet* уже
- *Already* уже

I've recently been to the crewing company-Я недавно был в крюинговой компании.

Present Perfect не употребляется, если есть указание на дату, точное время или период времени, закончившийся в прошлом. В этом случае используется прошедшее неопределенное время (Past Indefinite Tense).

Task1

Read and translate the sentences:

<i>The English sentence</i>	<i>The Russian equivalent</i>
1. Have you checked the suction and exhausted valves yet?	
2. I've just dismantled the motor because some sea water got into it.	
3. We have just started the second auxiliary engine again because it was not working.	
4. The Third Engineer has just stopped the pump because of its abnormal operation.	
5. We have found the reason of the corrosive wear in the cylinder.	
6. We have experienced some cases of the overheated turbocharger thrust bearings.	
7. They have had reports about several cases of cracks in the cylinder covers.	
8. Although these precautions reduced risk they have not completely eliminated the tendency of crack formation in the bottom of covers.	
9. To increase the safety of personnel in the engine room we have, in cooperation with manufactures of relief valves, initiated a development program for improving the flame arrester function of the crankcase relief valves.	
10. In recent years there have been a few cases where a crankcase explosion has resulted in injury to personnel who has been burnt by flames in the engine – room.	

Task 2

Make up sentences using one of the verbs from the box and Present Perfect Tense.

<i>buy</i>	<i>fill</i>	<i>lose</i>	<i>repair</i>	<i>stop</i>	<i>weld</i>
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- I have a new car. I _____ it.
- The Chief Engineer is looking for the manual. He can not find it.
He _____ it.
- There was no fuel in the tank. Now it's full. We _____ it.
- I don't hear the noise of the engine. The engine _____
- I don't see any cracks in the pipe any more. The welder _____
- The engineer told the motorman to repair the pump but it is still not working. The pump _____ yet.

Task 3

Translate the sentences from Russian into English using Present Perfect Tense

<i>The Russian sentence</i>	<i>The English equivalent</i>
1. Новая смазка сократила износ вращающихся деталей.	
2. Моторист уже проверил, как работает насос пресной воды после ремонта.	
3. Я уже прочитал инструкции и заменил поврежденные детали.	
4. Я только что обсудил с механиком утечку топлива.	
5. Мы только что прогрели двигатель.	
6. Мы уже закончили установку поршневых колец.	

SPEAKING

DIFFERENT TYPES OF MARINE ENGINE

Read the text and make a list of unknown vocabulary

There are four main types of marine engine: the diesel engine, the steam turbine, the gas turbine and the marine nuclear plant. Each type of engine has its own particular application.

The diesel engine is a form of internal combustion engine similar to that used in a bus. Its power is expressed as brake horsepower (bhp). This is the power put out by the engine. Effective horsepower is the power developed by the piston in the cylinder, but some of this is lost by friction within the engine. The power output of a modern marine diesel engine is about 40,000

brake horsepower. This is now expressed in kilowatts. By comparison the engine of a small family car has an output of about 80 bhp. Large diesel engines, which have cylinders nearly 3 ft in diameter, turn at the relatively slow speed of about 108 rpm. These are known as slow-speed diesel engines.

They can be connected directly to the propeller without gearing. Although higher power could be produced by higher revolutions, this would reduce the efficiency of the propeller, because a propeller is more efficient the larger it is and the slower it turns. These large slow running engines are used in the larger merchant ships, particularly in tankers and bulk carriers. The main reason is their low fuel consumption. More and more of the larger merchant vessels are being powered by medium-speed diesel engines. These operate between 150 and 450 rpm, therefore they are connected to the propeller by gearing. This type of engine was once restricted to smaller cargo ships, but now they are used in fast cargo liners as well as in tankers and bulk carriers. They are cheaper than slow-speed diesel engines, and their smaller size and weight can result in a smaller, cheaper ship.

In steam turbines high pressure steam is directed into a series of blades or vanes attached to a shaft, causing it to rotate. This rotary motion is transferred to the propeller shaft by gears. Steam is produced by boiling water in a boiler, which is fired by oil. Recent developments in steam turbines which have reduced fuel consumption and raised power output have made them more attractive as an alternative to diesel power in ships. They are 50 per cent lighter and on very large tankers some of the steam can be used to drive the large cargo oil pumps. Turbines are often used in container ships, which travel at high speeds.

Gas turbines differ from steam turbines in that gas rather than steam is used to turn a shaft. These have also become more suitable for use in ships. Many naval vessels are powered by gas turbines and several container ships are fitted with them. A gas turbine engine is very light and easily removed for maintenance. It is also suitable for complete automation.

Nuclear power in ships has mainly been confined to naval vessels, particularly submarines. But this form of power will be used more in merchant ships as oil fuels become more expensive. A nuclear-powered ship differs from a conventional turbine ship in that it uses the energy released by the decay of radioactive fuel to generate steam. The steam is used to turn a shaft via a turbine in the conventional way.

Task 4

Fill in this box to summarize the application of these engines.

Type of engine	Application
slow-speed diesel	
medium-speed diesel	
steam turbine	
gas turbine	
marine nuclear plant	

Task 5

Answer the questions using the information from the text

1. What is a diesel engine?
2. How is the diesel engine power expressed?
3. Why is some of the effective horsepower lost?
4. What are characteristics of a low-speed diesel engine (name the cylinder bore, rpm, power output)?
5. What is the main advantage of a low-speed diesel engine?
6. What kind of engine is called a directly coupled engine (low or medium-speed)?

SUPPLEMENTARY READING

Read the article. Prepare rendering of it using the phrases from APPENDIX II.

First MHI-MME low-speed engine enters service

The 35, 000dwt chemical carrier Chemroad Queen has become the first ship to enter service powered by Mitsubishi Heavy Industries Marine Machinery & Engine Co's (MHI-MME's) new UEC50LSH-Eco engine.

MHI-MME has been developing the 500 mm bore, 2,300 mm two-stroke as a state –of-the-art engine that incorporates cutting-edge technology to meet market needs that include reduced fuel consumption, slow steaming, low engine load capabilities and compliance with emissions regulations.

The 6UEC50LSH-Eco-C2 in Chemroad Queen was built by licensee Kobe Diesel Co and was delivered to the shipbuilder, Shin Kurushima Dockyard Co, in March after completing shop testing. Onboard testing was completed in August and the ship, owned by Iino Kaiun Kaisha, went into service without any complications.

The design of the UEC50LSH-Eco engine began with thorough market research. Engine power output and speed were adjusted to suit for chemical tankers, Handymax bulk carriers, Supramax bulk carriers and medium-range tankers.

MHI-MME says that it has now received follow up orders for the M/E 5UEC50LSH-Eco-C2 main engine, for 38,000 dwt chemical tankers to be built at Kitanihon Shipbuilding Co. It also says that it is receiving many enquiries about the engine.

(from Marine Propulsion and Auxiliary Machinery/ October/November 2015, p.29)

Unit 6

• <i>Grammar</i>	<i>THE PASSIVE VOICE</i>
• <i>Speaking</i>	<ul style="list-style-type: none"> • <i>AUXILIARY MACHINERY</i> • <i>IN THE ENGINE ROOM</i>
• <i>Supplementary reading</i>	<i>MAN ENERGY SOLUTIONS TWO-STROKE BUSINESS UNIT HAS STARTED THE DEVELOPMENT OF A LOW-PRESSURE GAS ENGINE AS A COMPLEMENT TO ITS EXISTING, SUCCESSFUL DUAL-FUEL ME –GI ENGINE.</i>

GRAMMAR

THE PASSIVE VOICE

СТРАДАТЕЛЬНЫЙ ЗАЛОГ

Глагол в Passive Voice (страдательном залоге) означает, что действие производится над предметом, выраженном подлежащим.

Example:

ACTIVE VOICE (АКТИВНЫЙ ЗАЛОГ)	PASSIVE VOICE (СТРАДАТЕЛЬНЫЙ ЗАЛОГ)
An oiler often uses a screwdriver.- Моторист первого класса часто использует отвертку.	A screwdriver is often used by an oiler. - Отвертка часто используется мотористом первого класса.
The connecting rod rotates the crankshaft. -Шатун вращает коленвал.	The crankshaft is rotated by the connecting rod.-Коленвал вращается шатунном.

Страдательный залог образуется при помощи вспомогательного глагола **to be** в соответствующей форме (am, is, are, was, were, will be) и инфинитива глагола с окончанием – ed для правильных глаголов (или 3-ей формой для неправильных глаголов).

PRESENT	He, she, it We, you, they	is used are used	A hammer is used Hammers are used	Молоток используют Молотки используют
PAST	He, she, it We, you, they	was used were used	A hammer was used Hammers were used	Молоток использовался Молотки использовались
FUTURE	He, she, it We, you, they	will be used	A hammer will be used	Молоток будет использоваться.

Task 1

Fill in the gaps using the verbs from the box and the necessary form of the passive voice. Translate the sentences from English into Russian.

Damage, stop, fit, make, open, start, cool, check, use, block

1. After the engine ...the service tanks ... for diesel oil and heavy oil.
2. The hull of our vessel ... of good steel.
3. Gangway ... to get from ashore onboard.
4. Bitts ... on the starboard side.
5. Ladder on the port side
6. All hatch covers ... by AB seamen.
7. Pistone of engine ...through the holes in the cylinder liners.
8. Sea-water pumps...after checking of the system

SPEAKING AUXILIARY MACHINERY

Study the word combinations

To run main propulsion machinery	Управлять главной энергетической установкой
To maintain propulsion machinery	Обслуживать энергетическую установку
To look after machinery	Обслуживать механизмы
To supply the needs of the main engines and boilers	Обеспечивать работу главных двигателей и котлов
To keep dry	Содержать сухим (льяла судна)
To keep trimmed	Поддерживать (судно) в удифферентованном состоянии
Domestic needs	Бытовые нужды
To apply the main power of the engines for propulsion	Обеспечивать движение судна
To moor the ship	Швартовать судно
To handle cargo	Обрабатывать груз, осуществлять грузовые операции
To provide for safety	Обеспечивать безопасность
To take responsibility for	Брать на себя ответственность за...
To be responsible for	Отвечать за...

Read and translate the text

Besides running and maintaining the main propulsion machinery of the ship, the Engineer Officer has a great deal of auxiliary machinery to look after. Auxiliary machinery covers everything mechanical on board ship except the main engines and boilers. It includes almost all the pipes and fittings and the equipment needed to carry out a number of functions. These functions may be summarized as follows: To supply the needs of the main engines and boilers. Air compressors are used to supply compressed air for starting engines. Coolers are used for cooling either oil or water.

Water for the boilers is also heated before being admitted into the boiler by feed water heaters. This increases the efficiency of the boiler.

To keep the ship dry and trimmed. This is done through the bilge and ballast pumping systems. The former removes water which has gathered in machinery, cargo and other spaces. The latter pumps water into and out of ballast tanks. In general cargo ships, these systems are usually interconnected and served by the same pumps. In tankers and other bulk carriers, these systems are entirely separate, because these ships may need to ballast at 12,000 tons/hour and therefore need larger pumps.

To supply domestic needs such as fresh water from distillation plant, sanitation from sewage plant and heating and ventilation from heaters and air-conditioners.

To apply the main power of the engines for propulsion and maneuvering. The engine power is transmitted to the propeller by a line of steel shafting. This is made up of the thrust shaft, intermediate shafts and the propeller shaft. Steering gear is also necessary to operate the rudder for maneuvering.

To supply the ship with electrical power and lighting. This is done by steam or diesel-powered generators.

To moor the ship and handle cargo. Deck machinery is extensive and varied. It can be divided into anchor-handling machinery-windlass and capstans, mooring machinery- winches and capstans, and cargo-handling machinery- winches and cranes. It also includes cargo oil pumps.

To provide for safety. Firefighting and fire detection equipment, lifeboat engines and launching gear are also included.

Responsibility for auxiliary machinery is often delegated to individual engineer officers, each one taking responsibility for the efficient working of certain items. A lot of equipment is duplicated, so that for example, one generator can be over- hauled without cutting off the supply of electricity to the ship. Engineer officers on tankers are also involved in operating the cargo pumping machinery, although the pump rooms themselves are often manned by officers from the Deck Department.

Task 2

Find in the text the English equivalents for the following sentences in Russian

1.	Увеличить КПД котла	
2.	Удалять воду	
3.	Откачивать воду	
4.	Обеспечивать судно электроэнергией и электрическим освещением	
5.	Использовать мощность главного двигателя для приведения судна в движение	
6.	Передавать мощность двигателя на винт	
7.	Управлять рулем	
8.	Прекращать подачу электроэнергии	

Task 3

Answer the questions using the information from the text

1. What machinery is called auxiliary?
2. What are air compressors used for?
3. What is the function of the coolers?
4. What does the bilge pump serve for?
5. What is the function of the ballast pumping system?
6. What's the difference between ballast pumping system in general cargo ships and those in tankers and other bulk carriers?
7. What plant is fresh water supplied by?
8. How is heating and ventilation carried out, by means of what plants?
9. What shafts make up the line of shafting?
10. What is the function of steering gear?
11. How is the ship supplied with electric power and lighting?
12. What machinery is used to moor the ship and to handle cargo?
13. What deck machinery do you know?
14. What machinery provides for the ship safety?
15. Who is responsible for auxiliary machinery?

Task 4

Use the model and make up sentences describing the functions of the auxiliary machinery

Model: Auxiliary machinery is used to carry out different functions.		
Auxiliary machinery	is used	
	is applied	
	is designed	
	is necessary	

Task 5

Translate the sentences from Russian into English

1. Механик должен обслуживать большое число вспомогательных механизмов	
2. Вспомогательные механизмы-это все механические устройства на борту судна, кроме главных двигателей и (главных) котлов	
3. Вспомогательные механизмы выполняют множество функций	
4. Вспомогательные механизмы используются, чтобы обеспечивать работу (нужды) главных двигателей и главных котлов.	
5. Осушительные и балластные насосы нужны, чтобы содержать судно в осушенном и удифферентованном состоянии.	

6. Вспомогательные механизмы применяются, чтобы обеспечивать бытовые нужды, такие как подача пресной и заборной воды, подогрев, вентиляция и обеспечение санитарии (sanitation)	
7. Мощность двигателя передается на винт с помощью валопровода (a line of shafting), который, в свою очередь, состоит из упорного вала, промежуточного вала, гребного вала.	
8. Дизель-генератор предназначен для того, чтобы давать электрэнергию и освещение	
9. Палубные механизмы применяются для швартовки и грузовых операций.	
10. Они делятся на механизмы приведения в действие якорного устройства и швартовные механизмы (anchor-handling machinery)	
11. К палубным механизмам относятся (они включают) также грузовые насосы (на танкерах).	
12. Противопожарное оборудование служит для обеспечения безопасности. Для этой цели предназначены двигатели спасательных шлюпок и устройства для спуска шлюпок.	

Task 6

Study the dialogue. Make use of the vocabulary after the dialogue

IN THE ENGINE ROOM

CHIEF ENGINEER: Mr.Wild, I see that the auxiliary engines have already been tested under operating conditions, haven't they?

FOREMAN:Yes, you are right. They have been tested under load.

CHIEF ENGINEER:And what about the main engine? Is it ready for the performance test?

FOREMAN:You see, the main engine still needs the final assembly.

CHIEF ENGINEER:Tell me, please, what exactly is left to be done?

FOREMAN:Well, the cylinder heads are to be fitted and, besides, the cooling system and starting air system are to be installed.

CHIEF ENGINEER:And when are you planning to start the main engine?

FOREMAN:Let me see. Yes, look. Tomorrow we'll begin fitting the cylinder heads, so in a fortnight, I hope, we'll be ready for starting the main engine.

CHIEF ENGINEER:What's the problem? Why so late?

FOREMAN:The cooling system that's what troubles me, really.

The cooling pumps haven't yet arrived. The subcontractors met with some difficulties, hence this delay. But yesterday we were informed that the pumps would be sent in a couple of days. So don't worry. In my turn, I'll do my best to speed up the work.

CHIEF ENGINEER: Have you got the certificates for the parts of the cylinder and piston assembly?

FOREMAN:Yes, they are ready. I mean all necessary certificates are at your disposal.

CHIEF ENGINEER: What company produces these turbochargers?

FOREMAN: It's our own production.

CHIEF ENGINEER: Very well. Tell me, please, what's the supercharged pressure at the engine nominal rating?

FOREMAN: 1.5 bars.

CHIEF ENGINEER: Is the supercharging system parallel?

FOREMAN: Yes, it is. Apart from main turbochargers, the motordriven compressor is switched on automatically to ensure the necessary air supply to the engine when it's running under low loads.

CHIEF ENGINEER: The pistons are oil-cooled, aren't they?

FOREMAN: Yes, it is common practice with these diesels.

CHIEF ENGINEER: And now I'd like to know about the protection for the main engine.

FOREMAN: I can explain that to you in the central control room. This way, please.

CHIEF ENGINEER: O.K. I'm right after you.

FOREMAN: Mr. Petrov, you may see here the electronic protection which ensures the immediate engine stopping in case of emergency such as: low oil pressure, temperature increase of oil and cooling water, or if the rotation speed is more than the nominal one.

CHIEF ENGINEER: I guess, the same kind of protection is provided for the auxiliary engines too, isn't it?

FOREMAN: You are right. What else would you like to see?

CHIEF ENGINEER: Now, let's have a look at the steam boiler.

FOREMAN: O.K. Follow me, please.

Vocabulary

Load	нагрузка
Turbocharger	турбокомпрессор (поршневого двигателя)
Performance test	испытание в рабочих условиях
Rating	мощность (номинальная)
Cooling system	система охлаждения
Supercharging	наддув
Starting air system	система пускового воздуха
To switch on	включать
To start the engine	запускать двигатель
To ensure	обеспечивать, гарантировать
Air supply	подача воздуха
Fortnight	две недели

Protection	защита
Hence	отсюда
Central control room	центральный пост управления
Delay	задержка
In one's turn	в свою очередь
Increase	увеличение
To be at one's disposal	быть в чьм-л распоряжении
Rotational speed	частота вращения

SUPPLEMENTARY READING

Read and understand the article. Prepare rendering of it using the phrases from APPENDIX II.

MAN Energy Solutions Two-Stroke Business Unit has started the development of a low-pressure gas engine as a complement to its existing, successful dual-fuel ME-GI engine.

The project is being conducted in conjunction with Hyundai Heavy Industries and has been initiated in response to customer demand from the LNG carrier segment.

“LP gas engine costs are slightly lower reflecting the lower cost of fuel gas supply system installations,” Brian Østergaard Sørensen, Vice President, Head of R&D within Two-Stroke Business, told the *Motorship*, noting that both MAN and HHI had received requests for LP main propulsion engines from shipowners in the gas carrier market.

In response, MAN plans to develop an LP gas engine to serve this segment of the market, with the intention of offering LP dual fuel LNG engines in late 2021 or early 2022. The initial focus will be on developing 70 bore engines for the gas carrier market, Sørensen added. The retrofit market has until now been dominated by MAN's ME-GI engine, and the HP design was likely to remain popular given the substantial effort required to convert conventional engines to LP engines.

Copenhagen leading development

In order to meet the 2022 commercial target, MAN Energy Solutions has invested in expanding its research capacity in Copenhagen, establishing an LP technology development team alongside the existing HP technology development team. As previously reported by the *Motorship*, the engine developer is also investing in a second test engine at its Copenhagen headquarters.

“The ME-GI engine is going to remain a strong pillar within MAN's portfolio. In fact, MAN is currently working on a Mark 2 concept for the ME-GI engine.”

Returning to the LP gas engine project, the team has been testing a number of low-pressure gas engine concepts. The engine designer has already concluded CFD modelling of a number of concepts, “several of which vary markedly from existing LP gas engine designs,” Sørensen said.

The designer plans to begin development testing on one of its two test engines in Copenhagen in the second half of 2019. “One of our selection criteria is that the final engine design will be easy for licensee engine manufacturers to deliver, and we will be drawing on HHI’s expertise in this area.”

As the final concept has not been selected, Sørensen would not elaborate on expected differences with other LP engine concepts, except to add that it was working on a “simpler safety concept from installation to operation”.

Similarly, final confirmation on the sub-suppliers for the project would need to wait until the final design selection, although MAN was collaborating with its standard suppliers. He noted that MAN had considerable experience of low-pressure gas engine operation within the Four-Stroke Business Unit in Augsburg, Germany, in addition to the Two-Stroke Business Unit’s own experience.

“We already offer an existing range of low-pressure auxiliary engines, such as 23/30DF, 28/32DF and 35/44DF, so this will allow us to offer an entire package,” Sørensen noted.

Filling a gap

The introduction of the low-pressure engine will fill a gap within our portfolio, but MAN’s HP gas engine offers better fuel efficiency, superior power density, and does not suffer from the same issues of methane slip that can affect LP engines, Sørensen noted.

For many segments, we expect the high-pressure ME-GI engine to remain an attractive solution, he concluded.

(from <https://www.motorship.com/news101/lng/man-to-develop-low-pressure-2-stroke-gas-engine>)

Unit 7

• Grammar	<i>THE PASSIVE VOICE</i>
• Speaking	<i>FUEL OIL SYSTEM</i>
• Supplementary reading	<ul style="list-style-type: none"> • <i>THE OPERATING INSTRUCTIONS FOR MAN MARINE DIESEL ENGINES</i> • <i>DUAL-FUEL ENGINE BECOMING 'GLOBAL STANDARD'</i>

GRAMMAR THE PASSIVE VOICE

Task1

Translate the sentences from Russian into English using the Passive Voice

1. Краску разводят растворителем.	
2. Масло доставляется насосом.	
3. Приказы отдаются офицерами.	
4. Мне сказали, где сейчас стармех.	
5. Все дизельные двигатели запускаются сжатым воздухом.	
6. Два вида котлов используется на судне.	
7. Стенка цилиндра охлаждается продувкой воздуха.	
8. Это оборудование используется редко.	
9. Я родился 25 февраля. А когда ты родился?	
10. Вибрация вызвана отсутствием балансировки вращающихся частей механизма.	
11. Компрессор поврежден.	
12. Моторист осматривает топливную систему перед тем как запускают двигатель.	

Task 2

Change the following sentences from the Active Voice into the Passive Voice using the example

1. A bulk carrier carries such cargo as coal or grain.	Such cargo as coal or grain is carried by a bulk carrier.
2. The central cooling system uses fresh water.	
3. They clean the lubricating oil system.	
4. Engineers supply instructions for operation and maintenance of machinery.	
5. The Third Engineer examines the piston.	
6. They carefully take out and inspect the fuel valves.	
7. The engine –room staff tests a new cylinder liner.	
8. This system supplies lubricating oil to the engine bearings.	
9. A pump delivers sea water.	
10. The engineer measures the clearance between the bearing and the shaft.	
11. The Chief Engineer gives orders.	
12. The wiper pushes a button to start the fire alarm.	

SPEAKING FUEL OIL SYSTEM

Practice saying the following words, give close attention to the words you don't know, learn the unknown words by heart

To arrange	Устраивать, организовывать
Diesel oil	Дизельное топливо
Heavy fuel oil	Тяжелое топливо (мазут)
To lead (led, led)	Вести, приводить
Electrically-driven	С электроприводом
Supply pump	Питательный насос
To connect	Соединять
Through	Через
To release	Освободить
To retain	Удерживать, сохранять
Liquid	Жидкость
Low	Низкий
Circulating pump	Циркуляционный насос
To pump	Работать насосом, накачивать
Full-flow filter	Полно поточный фильтр
To ensure	Удостовериться, гарантировать
Enough	Достаточный
Filling	Наполнение, заправка
Capacity	Вместимость, емкость
Higher	выше
Amount	Количество

To consume	Поглощать, тратить
Rest	Остаток
Constant	Постоянный
Fuel injection pump	Топливный насос высокого давления
Load	Загруженность
Spring-loaded	Подпружиненный
Overflow valve	Перепускной клапан
To insert	Вставлять, добавлять
To continue	Продолжать
Change-over	Переключение, переход
Necessary	Необходимый, нужный
To perform	Исполнять, выполнять
Even	Даже
Running	Работающий
Such	Такой
Inactive	Неактивный
Prolonged	Длительный, затянувшийся
Major	Большой, значительный
Environmental	Относящийся к окружающей среде
Requirement	Требование

Read and translate the text

The system is so arranged that both diesel oil and heavy fuel oil can be used. From the service tank the fuel is led to an electrically-driven supply pump. The venting box is connected to the service tank through an automatic deaerating valve, which will release any gases, but will retain liquids.

From the low pressure part of the fuel system the fuel oil is led to an electrically – driven circulating pump, which pumps the fuel oil through a heater and full-flow filter.

To ensure enough filling of fuel pumps, the capacity of electrically –driven circulating pump is higher than the amount of fuel consumed by the diesel engine. The rest of fuel oil is recirculated from the engine through the venting box. To ensure constant fuel pressure to the fuel injection pumps during all engine loads, a spring –loaded overflow valve is inserted in the fuel oil system in the engine.

When the engine is stopped in case of emergency, the circulating pump will continue to circulate the heated heavy fuel oil through the fuel oil system in the engine and to keep the fuel pumps heated and the fuel valves deaerated.

In special circumstances a change-over to diesel oil may become necessary –and this can be performed at any time, even when the engine is not running. Such a change –over is necessary if, for example, the valve will be inactive for a prolonged period with a cold engine because of docking, stop for more than five days, major repairs of the fuel system, environmental requirements.

Task 3

Match the Russian and the English sentences:

1. Плотность топлива необходима для пересчета массы и объема, тк коносаменты и накладные обычно указывают объем партии в тоннах, а емкость танков известна в куб.м. Она необходима также для регулировки центрифуг и обеспечения качественной очистки топлива.	a)All residual fuels will contain contaminants and to protect the engine some of these must be removed or reduced.
2. Вязкость определяет диапазон температур, при которых топливо может подаваться в систему и эффективно распыливаться.	b)Viscosity is required to calculate temperatures at which the fuel is treated and injected into the engine.
3. Все промышленные топлива обязательно содержат различные загрязнения, и для защиты деталей топливной системы перед вводом топлива в двигатель требуется его очистка.	c)Density of oil must be given since the consignment will be measured by weight. It will also be necessary to know this to adjust centrifuges to give efficient purification.
4. Механические примеси, такие как ржавчина и окалина, песок, пыль и частицы катализаторов нефтепереработки являются абразивными материалами, способными вызвать интенсивный износ топливных насосов, форсунок, цилиндрических втулок, поршневых колец и седел выпускных клапанов.	d)Liquid contaminants will be salt or fresh water, which may also contain other soluble unwanted substances, and are corrosive.
5. Жидкие примеси –забортная и пресная вода – могут содержать нежелательные компоненты в растворенном виде, а также являются инициаторами коррозии.	e)Solid contaminants may consist of rust, sand, dust and refinery catalysts (catalytic fines), all of which are abrasives and will cause wear in fuel pumps, injectors, cylinder liners, piston rings and exhaust valve seats.

SUPPLEMENTARY READING

THE OPERATING INSTRUCTIONS FOR MAN MARINE DIESEL ENGINES

Read the extract from the operating instructions for MAN MARINE DIESEL ENGINES.
Make a list of unknown vocabulary

Maintenance and care



Fuel system

Fuel

If Diesel fuel which contains moisture is used the injection system and the cylinder liners / pistons are often damaged. This can be prevented to some extent by filling the tank as soon as the engine is switched off while the fuel tank is still warm (formation of condensation is prevented). Drain moisture from storage tanks regularly.

In addition, the installation of a water separator upstream of the fuel filter is mandatory.

Do not use any additives to improve flow properties in winter.



Caution:

Use only approved fuels, lubricants etc. (see brochure "Fuels, lubricants etc."). Otherwise the manufacturer's warranty will become null and void.

High-pressure pump

No changes may be made to the high-pressure pump and the control unit. If the lead seal is damaged the warranty on the engine will become null and void.

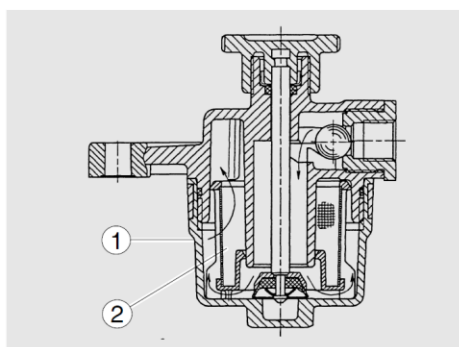
Faults

We urgently recommend that malfunctions of the injection system be eliminated only by a workshop authorised to perform such work.

Cleaning fuel pre-cleaner

Strip the fuel pre-cleaner:

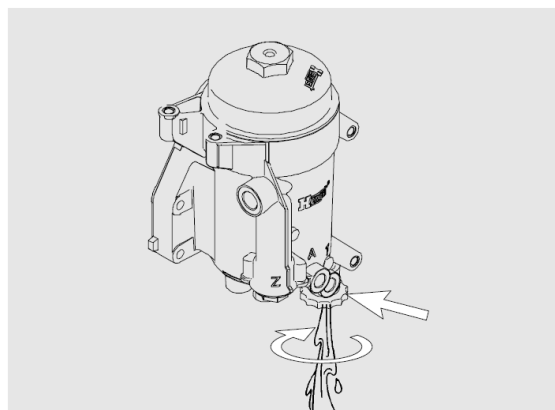
- Remove filter housing ①
 - Wash out filter housing and gauze filter in clean Diesel fuel and blow them out with compressed air
 - Reassemble using new seal
 - Screw on filter housing and tighten it to 10 – 12 Nm
-
- Actuate plunger of hand priming pump
 - Screw in and tighten plunger on hand pump
 - Check fuel pre-cleaner for leaks



Fuel service center (KSC)

Draining moisture:

Unscrew drain plugs at every oil change until moisture has been discharged and clean fuel flows out.



Changing fuel filter

Only when the engine is switched off.

Close shut-off valves between engine and tank.

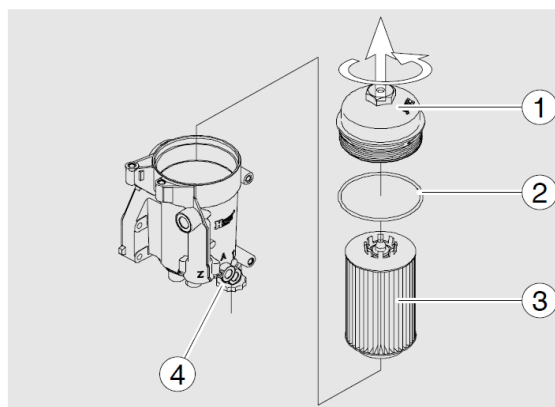
- Open drain screw ④
- Screw off housing cap ① and let off fuel



Caution:

Wait without fail until all fuel has drained out, as dirt may otherwise get to the clean side.

- Remove cap and filter element
- Detach filter element ③ from cap
- Detach sealing ring ②
- Clean cap
- Replace sealing ring
- Attach new filter element
- Screw in filter element and cap and tighten down to 25 Nm
- Close drain screw ④ again
- Bleed the fuel system
- Check fuel service center for leaks



Caution:

Used fuel filters are classed as dangerous waste and must be disposed of accordingly.

Fuel pre-filter with water separator

Draining water:

- Open drain screw ① and let off water.
- Close drain screw ① again

Changing filter element

Only when the engine is switched off.

Close shut-off valves between engine, pre-filter and tank.

- Disconnect plug
- Remove filter bowl ② and filter element ③
- Wet seal on new filter with fuel
- Screw on filter (10–12 Nm) ③ and filter bowl (20 Nm) ②
- Connect plug
- After this, bleed the fuel system
- Check filter for leaks



Caution:

Used fuel filters are classed as dangerous waste and must be disposed of accordingly.



Caution:

Observe position of lever on 3-way cock.

- A Continour operation (both filter halves in operation)
- B Left-Hand filter cut out
- C Right-Hand filter cut out



Read and understand the article. Prepare rendering of it using the phrases from APPENDIX II.

DUAL-FUEL ENGINE BECOMING 'GLOBAL STANDARD'

Wartsila has claimed that the upgraded version of the 34DF dual-fuel engine is rapidly becoming established as an industry standard. The three major South Korean shipyards are supporting the use of this engine for auxiliary applications in the liquefied natural gas (LNG) carrier segment, where dual-fuel engines are favoured. South Korea currently has more than 80 per cent of the total orderbook for LNG tankers, while the Wartsila 34DF engine has achieved an auxiliary application market share of approximately 70 per cent.

During the first half of this year, Wartsila was awarded contracts for 56 34DF auxiliary engines for 14 new LNG carriers being built for four different owners. This means that the date Wartsila has received orders for almost 100 of the engines from these three yards, since the model was relaunched with a higher maximum continuous rating in 2013. The ships are being built for European, American and Asian owners.

(Marine Propulsion and Auxiliary Machinery/October-November 2015, publ. by rivera,
p.29)

Unit 8

• Grammar	<i>MODAL VERBS AND THE PASSIVE VOICE</i>
• Speaking	<i>COOLING WATER SYSTEMS</i>
• Supplementary reading	<i>THE OPERATING INSTRUCTIONS FOR MAN MARINE DIESEL ENGINES</i>

GRAMMAR

MODAL VERBS AND THE PASSIVE VOICE

Task 1

Translate the sentences from English into Russian paying attention to modal verbs, their equivalents and the Passive Voice

1. The belts <u>should be stretched</u> just so much that they <u>can easily</u> be pulled together 2-3 cm by hand right in the middle between the belt pulleys.	
2. Knock with the tin mallet on the spanner handle if the lock ring <u>cannot be loosened</u> with the spanner only.	
3. These surfaces <u>should be lubricated</u> each time the separator bowl is assembled.	
4. The screw <u>should be lubricated</u> with castor oil.	
5. If the sludge is liquid the interval between the discharges <u>can be prolonged</u> .	
6. The power output of any engine <u>can be increased</u> by burning more fuel in the cylinder.	
7. All engine parts <u>may be removed</u> and replaced easily.	
8. The worn rings <u>have to be replaced</u> by new ones.	
9. When the wear reached allowable level the cylinder <u>had to be rebored and resurfaced</u> .	
10. To burn more fuel more quantity of air <u>should be supplied</u> .	
11. These valves <u>were to be pressure tested</u> .	

SPEAKING COOLING WATER SYSTEMS

Practice saying the following words, give close attention to the words you don't know, learn the words by heart

Several	несколько
Jacket cooling	охлаждение водяной рубашкой
Circuit	круг, схема
Advantage	преимущество
Related	связанный, имеющий отношение к
First cost	себестоимость
Set	комплект, набор
Installation	установка
Few	мало, пара
Piping system	трубопроводная система
Disadvantage	недостаток
Non-corrosive	нержавеющий
Galvanized	оцинкованный
To reduce	сокращать
Utilization	утилизация
Interrelated	взаимосвязанный
Positioning	установка, расстановка
To serve	служить
To achieve	добиваться
Lowest	наименьший
To obtain	получать, добывать
On the other hand	с другой стороны
To prevent	предотвращать
Stiffening	загустевание, загущение
Suction side	сторона всасывания
Sensor	датчик
To be located	находиться, располагаться
Drain pipe	сточная труба
To draw water	набирать воду
Thermostatically controlled	регулируемый с помощью термореле
Regulating valve	регулирующий клапан
Carefully	тщательно, внимательно
To monitor	наблюдать, проверять
Fatigue	износ
Cavitation	кавитация
Scale formation	накипеобразование

Read and understand the text

The water cooling can be arranged in several systems:

- A low temperature seawater cooling system and a freshwater cooling system only for jacket cooling.
- A central cooling water system with three circuits: a seawater system, a low temperature freshwater system for central cooling, and a high temperature freshwater system for jacket water.

The advantages of seawater cooling system are mainly related to the first cost:

- only two sets of cooling water pumps (seawater and jacket water);
- simple installation with few piping systems.

The disadvantages are:

- seawater goes to all coolers and so maintenance cost is higher;
- expensive seawater piping of non-corrosive materials such as galvanized steel pipes.

The advantages of central cooling system are:

- only one heat exchanger is cooled by seawater and so only one exchanger will be overhauled;
- all other heat exchangers are freshwater cooled and can be made of a less expensive material;
- few non-corrosive pipes are installed;
- reduced maintenance of coolers and components;
- increased heat utilization.

The disadvantages are:

- three sets of cooling water pumps (seawater, freshwater low temperature and jacket water high temperature);
- higher first cost

THE SEAWATER COOLING SYSTEM

The seawater cooling system is used for cooling of the main engine lubricating oil cooler, the jacket water cooler, and the scavenge air cooler. The lubricating oil cooler should be connected in parallel with other coolers. The interrelated positioning of the coolers in the system serves to achieve:

The lowest possible cooling water inlet temperature to the lubricating oil cooler in order to obtain the cheapest cooler. On the other hand, in order to prevent the lubricating oil from stiffening in cold services, the inlet cooling water temperature should not be lower than 10 °C.

- The lowest possible cooling water inlet temperature to the scavenge air cooler in order to keep the fuel oil consumption as low as possible.

SEAWATER THERMOSTATIC VALVE

The temperature control valve is a three-way valve which can recirculate all or part of seawater to the pump suction side. The sensor is located at the seawater inlet to the lubricating oil cooler, and the temperature level must be minimum of 10°C.

JACKET COOLING WATER SYSTEM

The jacket cooling water system is used for cooling of cylinder liners, cylinder covers and exhaust valves of the main engine and heating of the fuel oil drain pipes. The jacket water pump draws water from the jacket water cooler outlet and delivers it to the engine.

At the inlet to the jacket water cooler there is a thermostatically controlled regulating valve with a sensor at the engine cooling water outlet, which keeps the main engine cooling water outlet at temperature of 80°C. The engine jacket water must be carefully maintained and monitored to avoid corrosion, corrosion fatigue, cavitation and scale formation.

CENTRAL COOLING WATER SYSTEM

The central cooling water system has only one heat exchanger cooled by seawater and by the other coolers, including the jacket water cooler, which is cooled by the freshwater low temperature (FW-LT) system. To prevent too high scavenge air temperature, the cooling water temperature in the FW-LT system is normally 36°C.

The components of seawater system:

- central cooling water pumps, low temperature;
- central cooling water thermostatic valve;
- sea –water cooling pumps;
- central cooler

The low temperature cooling system must be equipped with a three-way valve which by-passes all or part of the fresh water around the central cooler.

The sensor is located at the outlet pipe from the thermostatic valve and keeps a temperature level at minimum 10 °C.

Task 2


Answer the questions using the information from the text

1. What systems can the water cooling be arranged in?
2. What are the pros and cons of seawater cooling system?
3. What are the advantages of central cooling system?
4. What is the seawater cooling system used for?
5. What is the function of the temperature control valve?
6. What is the jacket cooling water system used for?
7. Why is the cooling water temperature in the FW-LT system normally 36°C?
8. What are the components of seawater system?


SUPPLEMENTARY READING

Read and translate the extract from the operating instructions for MAN MARINE DIESEL ENGINES. Make a list of unknown vocabulary


Maintenance and care



Cooling system

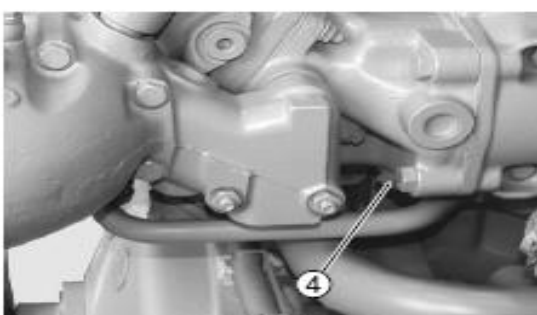
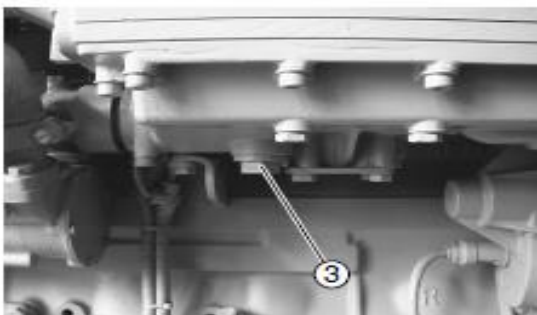


 **Danger:**
Draining hot coolant involves a risk of scalding.

Draining the cooling system

 **Caution:**
Drain coolant into a suitable container and dispose of it in accordance with regulations.

Drain coolant as follows when cooling system has *cooled down*:

- Briefly open cap ① (large cap) on the filler neck of the expansion tank for pressure compensation
- Remove drain screws in oil cooler housing ②, intercooler ③, exhaust manifold ④
- Then take off the cap ①
- Drain coolant into a container of adequate size
- Refit screw plugs
- Fill / bleed the cooling system





Maintenance and care

Fill / bleed the cooling system (only when engine has cooled down)

Fill the cooling system of the engine with a mixture of drinkable tap water and anti-freeze agent on the ethylene glycole basis or anti-corrosion agent.

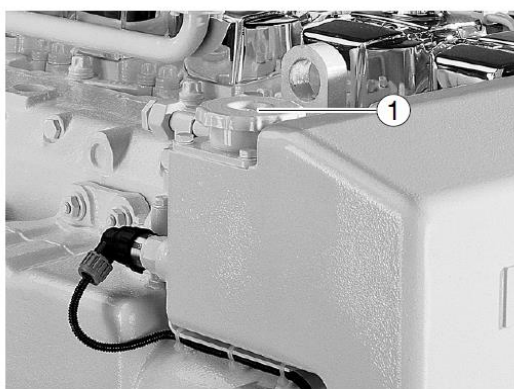
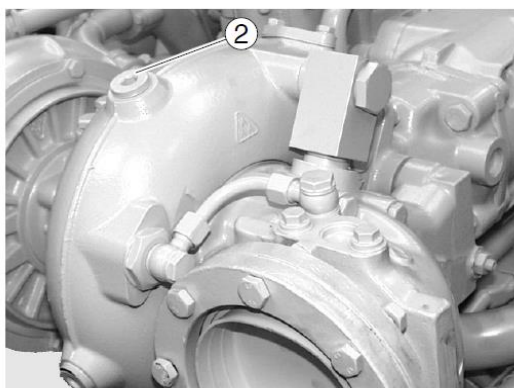
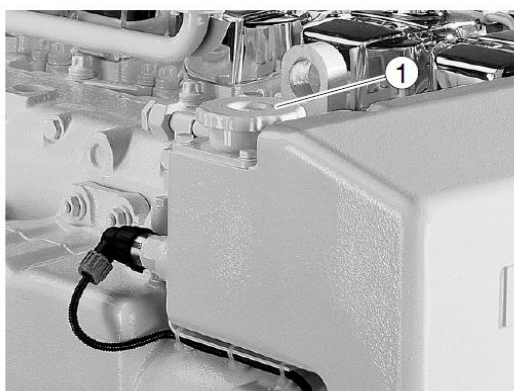


Caution:

Use only approved fuels, lubricants etc. (see brochure “Fuels, lubricants etc.”). Otherwise the manufacturer’s warranty will become null and void.

Coolant must be added at the filler neck only (①, large cap). When topping up do not add cold coolant if the engine is still warm from operation. Ensure that the ratio of water to anti-freeze is correct. Find the cause of the loss of coolant and have it eliminated.

- Remove cap (①, large cap)
- Set heating (if fitted) to full output, open all shut-off valves, open bleeders (if fitted)
- Unscrew bleed screw ② on liquid-cooled turbocharger
- Slowly fill up with coolant via filler neck on expansion tank until fluid level has reached the lower edge of the filler neck
- Screw in bleeder screws ② again and refit cap ①
- Let engine run at a speed of 2,000 rpm for approx. 5 minutes
- Switch off engine, carefully turn cap ① with safety valve to first detent –let off pressure– then carefully take off cap



Danger:

Risk of scalding.

Maintenance and care



- Before the engine is next put into operation (with the engine cold) check the coolant level and top up if necessary.
- Repeat this procedure until no more coolant can be added



Note:

The turbochargers must not be bled while the cooling system is being topped up.



Danger:

If, in an **exceptional** case, the coolant level has to be checked in an engine that has reached operating temperature, first carefully turn the cap ⑤ with safety valve to the first stop, let off pressure, then open carefully.



Note:

Don't open the cooling system when the engine is at operating temperature. This causes a pressure loss in the cooling system.

If the cooling system has been opened when the engine is at operating temperature this can lead to the alarm pressure in the expansion tank when the engine is then put into operation and to a reduction in the engine output.

Coolant pressure in the expansion tank is only built up again when the engine has cooled down. The cooling system must therefore only be filled up when the engine is cold.

Unit 9

GRAMMAR	REVISION
SPEAKING	LUBRICATING SYSTEM
SUPPLEMENTARY READING	THE OPERATING INSTRUCTIONS FOR MAN MARINE DIESEL ENGINES

GRAMMAR

Revision

Task 1

Fill in the gaps using the verbs from the box. Pay attention to the proper tense form.

start	heat	renew	not keep	repair	inspect	be
-------	------	-------	----------	--------	---------	----

- _____ the fuel oil for start of the main engine!
- The 2nd Engineer and his motorman _____ the broken nonreturn valve tomorrow.
- The superintendent _____ deck and machinery spaces equipment from 10:30 till 11:30.
- Somebody _____ just _____ the fire alarm.
- Why _____ you _____ watch yesterday?
- _____ the engine –room ladder!
- The liner temperature _____ too low.

Task 2

Translate from Russian into English

1. Замените поврежденный подшипник	
2. Нельзя находится в машинном отделении без защитной одежды.	
3. Моторист всегда тщательно осматривает топливную систему перед тем, как запустить двигатель	
4. Я решил наполнить расходные баки, так как уровень масла был низкий.	
5. Вы уже подготовили воздухоохладитель и турбонагнетатель к работе?	
6. 4-му механику приказали починить лебедку как можно скорее.	
7. В каком порту Вы можете использовать сепаратор льяльных вод?	
8. Моторист чистит воздушный фильтр вспомогательного двигателя сейчас.	
9. Мы не будем вынимать поршень из цилиндра во время ремонта.	

SPEAKING LUBRICATING SYSTEM

Practice saying the following words, give close attention to the words you don't know, learn the words by heart

to supply	обеспечивать, поставлять
lubricating oil	смазочное масло
bearing	подшипник
through	через, сквозь
inlet	входное отверстие
to cool	охлаждать
butterfly valve	клапан-бабочка
to extend	тянуться
directly	прямо
drain arrangement	дренажный механизм
drain tank	сточная цистерна
to condense	конденсировать
by means of	посредством
thermostatic valve	клапан термостата
to distribute	распределять, задавать
to divide	разделять
to introduce	представлять, вводить
booster pump	вспомогательный насос
bore	диаметр
to require	требовать
actuator	силовой привод
outlet	выпускное отверстие
oil pan	маслосборник
manual	ручной
centrifuge	центрифуга
attended	обслуживаемый
total	полный
discharge	разгрузка
partial	частичный, неполный
water resistant	водостойкий
three-way valve	трехходовой клапан
to by-pass	обходить

Read and understand the text

LUBRICATING AND COOLING OIL SYSTEM

This system supplies lubricating oil to the engine bearings through the inlet “R” and cooling oil to the piston through the inlet “U”. The butterfly valve at the lubricating oil inlet “R” is supplied with the engine. The engine crankcase is vented through “AR” by a pipe which extends directly to the deck. This pipe has drain arrangement so that condensed oil in the pipe can be led to a drain tank.

Lubricating oil is pumped from a bottom by means of the main lubricating oil pump to the lubricating oil cooler, a thermostatic valve and through a full-flow filter to the engine, where it is distributed to the piston and bearings. The major part of oil is divided between

piston cooling and crosshead lubrication. It was necessary to introduce the booster pumps for the large bore engines in order to maintain the required oil pressure at the inlet “Y” for the exhaust valve actuators and the camshaft.

The turbochargers are lubricated from the main engine system, through AA “Turbocharger lubricating oil pipes”, “AB” is the lubricating oil outlet from the turbocharger to the lubricating oil bottom tank, and it is vented through “E” directly to the deck from the engine, the oil collects in the oil pan, from where it is drained off to the bottom tank.

LUBRICATING OIL COOLER

The lubricating oil cooler is of a tube type (made of seawater resistant material) or a plate type heat exchanger with plate material of titanium unless fresh water is used in a central cooling system.

LUBRICATING OIL TEMPERATURE CONTROL VALVE

The temperature control system can, by means of a three –way valve, by-pass the cooler totally or partly.

LUBRICATING OIL CENTRIFUGES

Manual cleaning of centrifuges can only be used for attended machinery spaces (AMS). For unattended machinery spaces (UMS) automatic centrifuges with total discharge or partial discharge are used.

Practice saying the following words, give close attention to the words you don't know, learn the words by heart

CYLINDER LUBRICATING OIL SYSTEM

gravity –feed	подача масла (самотеком)
to be equipped with	быть оборудованным
built-in	встроенный
Float	поплавок
to keep	хранить, держать
Size	размер
to depend on	зависеть от
Owner	владелец, хозяин
Yard	верфь
dimensioned	имеющий размеры
consumption	потребление, расход
orifice	отверстие
to introduce	помещать, вводить
to deliver	доставлять, снабжать
Via	через, сквозь
non-return valve	невозвратный клапан
during	в течении, во время
to pass	проходить

Read and understand the text

The cylinder lubricators are supplied with oil from a gravity-feed cylinder oil service tank, and they are equipped with built-in floats, which keep the oil level constant in the lubricators. The size of the cylinder oil service tank depends on the owner's and yard's requirements, and it normally dimensioned for minimum two days' consumption.

CYLINDER LUBRICATION

Each cylinder liner has a number of lubricating orifices, through which the cylinder oil is introduced into the cylinders. The oil is delivered into the cylinder via non-return valves when the piston rings during the upward stroke pass the lubricating orifices.

Task 3

Match the English sentences with the Russian variants. Ask 5 questions to any English sentence from the Task 3 (general, alternative, question to the subject, special question, and tag question).

1. The oil then passes through the fine filters to the engine.	1. Масляные насосы высокого давления принимают масло из сливной цистерны через фильтры грубой очистки, которые должны быть расположены достаточно удаленно от низших точек, во избежание засасывания воды или шлама, которые могут отставаться в цистерне.
2. The pumps discharge at pressure through the oil cooler, ensuring that sea water at its lower pressure cannot leak into the oil system in the event of a fault in the cooler.	2. Масло при высоком давлении поступает в нагнетательную магистраль, проходя через маслоохладители, причем высокое давление по масляной стороне гарантирует от попадания в масло забортной воды при неисправности маслоохладителя.
3. Lubricating oil pressure pumps draw oil from the engine drain tank through suction strainers, the tank suction being clear of the lowest point to avoid picking up any water or sludge which may have settled.	3. Затем масло через фильтры тонкой очистки поступает к двигателю.
4. Various sections of the lubricating system may require different pressures and to accommodate this engine driven booster pumps may raise the supply pressure, while pressure reducing valves and restricted orifices may reduce pressure or flow to other parts.	4. Здесь оно распределяется для смазки всех подшипников, охлаждения поршней, форсунок, привода выпускных клапанов, систем управления и др.
5. Used oil drains to the bottom of the crankcase and passes through strainers by gravity to the drain tank.	5. Различные секции системы смазки могут использовать масло при различных давлениях, ввиду чего могут потребоваться бустерные насосы, повышающие при необходимости давление до рабочего, или редукционные клапаны и дроссельные шайбы для снижения давления или расхода масла в определенных частях системы.
6. Drain returns are kept remote from the pump suction and must be submerged to reduce aeration and to make a safe seat.	6. Отработавшее масло сливается в поддон картера и самотеком поступает через сетчатые фильтры грубой очистки в сливную цистерну.
7. With oil-cooled pistons each piston oil return has its temperature monitored and it then passes through a sight glass before returning to the crankcase.	7. Дренажная труба должна вводиться в цистерну вдали от приемного патрубка циркуляционного насоса, погруженной под уровень масла в цистерне, для предотвращения аерации и разбрызгивания масла.
8. It will be distributed to all bearings, piston cooling, sprayers, exhaust valve actuators, control systems etc.	8. В системе с масляным охлаждением поршней слив масла от каждого поршня должен иметь датчик температуры и смотровое стекло для наблюдения за состоянием масла перед его возвратом в картер.

SUPPLEMENTARY READING

Read and translate the extract from the operating instructions for MAN MARINE DIESEL ENGINES. Make a list of unknown vocabulary

Maintenance and care



Lubrication system

Ensure utmost cleanliness when handling fuels, lubricants and coolants.



Caution:

Use only approved fuels, lubricants etc. (see brochure "Fuels, lubricants etc."). Otherwise the manufacturer's warranty will become null and void.

Refilling with oil



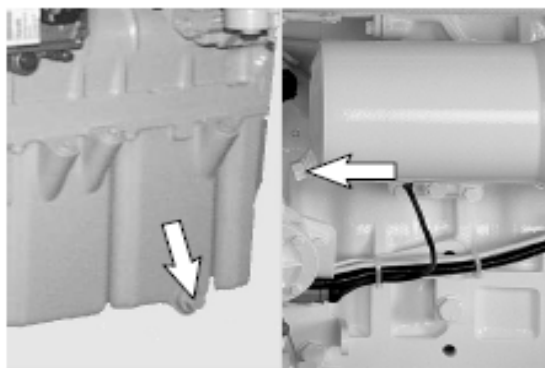
Danger:

The oil is hot – risk of scalding. Do not touch the oil drain plug with bare fingers. Oil is an environmental hazard. Handle it with care!

With the engine at operating temperature, remove the oil drain plugs on the oil sump and the oil filter bowl and allow the old oil to drain off completely.

Use a vessel of sufficient size to ensure that the oil does not overflow.

Refit the oil drain plugs with new gaskets.



Note:

Change the oil filter elements every time the engine oil is changed.



Maintenance and care

Electric oil drain pump (option) for engine and gearbox oil

Since the oil drain plug on the engine oil pan and on the gearbox is frequently not accessible, an electric oil drain pump may be fitted to or in the vicinity of the engine.



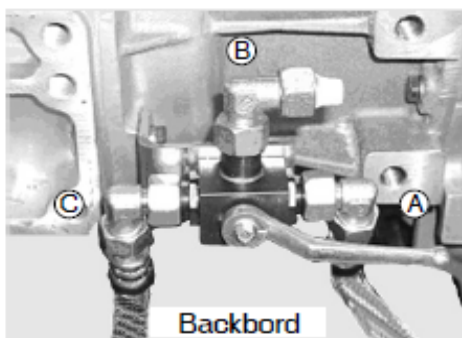
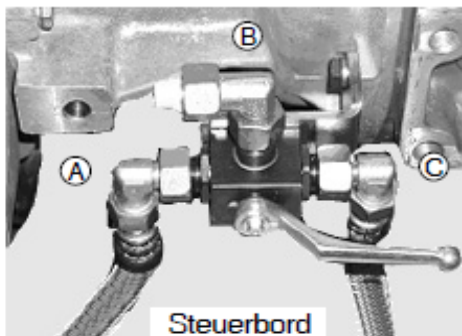
Caution:

Observe position of lever on 3-way cock.

A Draining of engine oil

B Lever shut-off position

C Draining of gearbox oil



Open cap on oil drain hose.

While engine is at operating temperature press button ① on oil drain pump and pump off old oil. Use a vessel of sufficient size to ensure that the oil does not overflow.



Caution:

Once the oil has been pumped off, turn lever on 3-way cock to centre position and close up oil drain hose.



Note:

Change the oil filter elements every time the engine oil is changed.



Unit 10

GRAMMAR	REVISION
SPEAKING	MAINTENANCE AND STANDARD OPERATION PROCEDURES
SUPPLEMENTARY READING	MAN ES DUAL-FUEL ENGINES RACK UP 1 MILLION OPERATING HOURS

GRAMMAR

REVISION

Task 1

Translate the sentences from Russian into English using verbs given in English in

Active or Passive voice

The verb to be used	The sentence in Russian	The sentence in English
1.to disassemble	Вы должны разобрать двигатель за два дня	
2.to dismantle	Пожалуйста, принесите все разобранные части	
3.to disjoint	Эти клапаны необходимо демонтировать	
4.to overhaul	Мы планируем перебрать вспомогательный двигатель	
5.to align	Старший механик приказал отцентрировать коленчатый вал	
6.to drain	Моторист слил воду из продувочного коллектора	
	Этот трубопровод должен быть осушен	
7.to grind	Тебе нужно будет зашлифовать поверхность шлифовальным станком до покраски.	
8.to carry out	Ремонт судна должен выполняться в соответствии с технической документацией.	
9.to measure	Ты можешь измерить давление цилиндра?	
10.to engage	Он включил валоповоротный (turning gear) механизм, чтобы повернуть двигатель	
11.to disengage	Шестеренки были разъединены	
12.to shut	Не перекрывайте охлаждающую воду сразу же после остановки дизельного двигателя	

SPEAKING

MAINTENANCE AND STANDARD OPERATION PROCEDURES

Study the information below and make a list of unknown vocabulary, pay attention to underlined words and word-combinations

Main engine

- Each type of engine is designed to operate at maximum pressure and maximum speed.
- It's important to get almost equal power output from each cylinder.
- The fuel injection equipment must be maintained in perfect condition and the fuel valve should be checked regularly. Spare fuel valves must be kept for a possible immediate change without big loss of time.
- All parts of the scavenging air system and spaces should be regularly inspected for cleanliness.
- Crankcase and running gear inspections should be made regularly to check all is in good condition.
- Cylinder oil consumption rate must be monitored and controlled by the Chief Engineer.
- Crankcase oil must be maintained in clear condition and free of water. The oil should be centrifuged continuously at 90°C.
- Fuel oil should be properly cleaned by centrifuging.

Auxiliary engines

- These engines must be maintained to a high standard as they are necessary for the efficient and proper operation of all other machinery and equipment onboard.
- In order to reduce maintenance and fuel costs, running auxiliaries should be kept to the minimum enough to maintain the electrical requirements.
- All non-running engines should be kept in a "Ready to Run" condition for a quick start in case of emergency.
- Lube oil should be changed after each overhaul (approximately 6000 hours).
- The lube oil should be also changed if it is not clean or of bad quality.

Boilers and pumps

- The Chief Engineer must always know the general condition of any boiler in his charge.
- The heating surface must be kept clean.
- All boiler gauge glasses, drain valves, and soot blowers must be kept in proper operational condition.
- All safety devices, alarms, and automatic controls must be kept in

working condition. All alarms and safety systems should be tested every month.

- All pumps must be maintained in proper operational condition. Glands should be tightened to prevent leakages to bilges and possible loss of suction. Necessary gauges must be maintained in order to monitor the pump efficiency.

Air compressors

- Air compressors must be maintained in good working condition for a quick start of vessels engine manoeuvring.
- A spare set of suction and delivery valves must be kept.
- The use of synthetic oil improves general condition and cleanliness of the valves.

Valves /pipes

- It is very important that all valves and pipelines on a vessel are kept in good condition.
- Pipelines should be completely tightened and valves must be kept completely functional all the time. This is very important when it is necessary to isolate tanks and equipment especially when repairs are required.
- All pipelines and valves should be checked on a regular basis.

Windlass and deck machinery

- The lubrication is the Chief Officer's responsibility but the Chief Engineer is responsible for all mechanical and electrical equipment.
- Correct condition of the brakes, clutches, gearing must be checked by the Chief Engineer every voyage.

Deck cranes

- This equipment requires close attention and must be tested at least once a voyage but especially when it will be used in the near future.
- All safety devices must be kept in good operational condition.
- It is very important that the hydraulic oil is maintained clean without water or other substances.
- Filters and magnetic plugs must be checked and cleaned every time before the cranes are required.
- The hydraulic oil should be renewed every 6 months.

Electrical equipment

- The electrical equipment on the vessel must be maintained in safe condition. The Chief Engineer should check this by regular personal inspections and supervision of the Electrical Engineer.
- Voltage in excess of 55 volts AC are lethal. Circuits must be isolated before start of work.
- Moisture, heat, overloading and mechanical damage can have serious effects on the electrical insulation. Wiring especially in cargo spaces on dry cargo ships and on

open deck should be regularly inspected. If the fault is serious and repairs cannot be immediately carried out, the circuit must be isolated.

- The insulation resistance of electric motors, equipment and circuits should be checked once every year.
- Emergency batteries must be maintained in perfect condition and specific gravity of the acid or alkali liquids should be checked every week when batteries must be topped up by distilled water if required.

Standard operations in extreme weather conditions

During periods when the ship is in cold weather conditions precautions must be taken to prevent damage to the ship and systems. There is a risk that equipment will freeze. Pay attention to relief valves and cooling water systems. Use heating systems if they are fitted.

The gas condensers and heat exchangers should be drained when they are not in use. Water collected on the discharge side of relief should be drained off.

Rotating equipment

Cold weather may cause cargo condensation in rotating equipment that may enter the crankcase, mix with the lubricating oil and cause damage to the bearings with the possibility of overheating resulting in an explosion. Crankcase heaters must be used to reduce the possibility of cargo condensing.

Cargo compressors

During periods of freezing weather the following precautions must be taken to prevent damage to the cylinder blocks of cargo compressors. Pay more attention to compressors if they are located on the open deck:

- 1) There must be sufficient level of anti-freeze in the cooling system to prevent freezing at the temperature of minus 20°C.
- 2) The density of the anti-freeze mixture must be checked by a hydrometer or another density measuring device.

Pneumatic valves and control systems

During periods of cold weather pneumatic valves and control systems may work slowly or don't operate. It is very important that the drier on the control air compressor operates correctly.

Pipelines

All pipelines that have water and may be frozen must be drained when they are not in use. This includes freshwater lines, compressed air lines, ballast and cooling water lines. The drain valves on these lines should be in the open position. If any water system was drained this fact should be recorded.

Task 2

Find in the text English equivalents to Russian words and word-combinations:

Равная выходная мощность	
Без потери времени	
Проверить на чистоту	
Уровень потребления топлива	
Подвергаться центрифугированию	
Эффективная работа	
Сократить затраты на топливо	
Водомерное стекло	
Обдувочные аппараты	
Сальник	
Утрата всасывающей способности	
Сохранять полную функциональность	
Отделить (изолировать)	
Сцепление, муфта	
Требовать пристальное внимание	
Гидравлическое масло	
Смертоносный	
Щелочь	
Меры предосторожности	
Плотность, удельный вес	

Task 3

Answer the questions using the text and word-combinations from Task 2:

1. What is important to get from each cylinder?
2. What are spare fuel valves kept for?
3. How are auxiliary engines usually maintained?
4. How often and why should lube oil be changed?
5. How often should all alarms and safety systems of boilers and pumps be tested?
6. What must be done to monitor the pump efficiency?
7. What must be done with pipelines if they are not in use?
8. What standard operations in extreme weather conditions are given in the text?

Task 4

In the following conversations dramatising incidents and procedures, that could take place on any ship, are given examples of the proper use of English where it is the working language. You are to

- Translate the Synopsis (краткое изложение содержания),
- Then read and talk paying attention to the speech patterns (речевые модели) and maritime English vocabulary in which the matters described in the Synopsis have been realized in the individual talk,

- In A-talk, take special notice of the radio and telephone communication techniques, commands and responses usage, in order to use them later in your own experience

Normal machinery operations; going to stand-by; starting an alternator; providing water supply on deck during manoeuvring; checking the cooling water and fire mains (пожарная магистраль) pressures; checking the gland seal on a general service pump for leakage; keeping the Bridge informed.

A.- Hello Control Room, Third Mate here. We've got one hour to go before stand-by.

B.- Understood. One hour before stand-by.

A.- We will require water on deck during manoeuvring.

B.- The bridge want to go to stand – by in one hour. They want water on deck.

C.- We'll start the stand-by alternator. Be sure to check the cooling water pressure.

E. – Yes Sir. Go and check the alternator. Be sure to check the cooling water pressure.

D.- Hello Bridge, Second Engineer speaking. Two alternators running, starting second steering motor.

E.- I've checked the port alternator. Lube oil pressure, cooling water temperature and pressure all normal.

D.- The pressure is correct. We can start number two general service pump.

C.- Yes Sir. Start number two general service pump.

D.- Third, go and check the gland seal on number two general service pump.

E.-Yes Sir. Go and check the gland seal on number two general service pump.

A.- Fire mains are pressurized. Ready for stand-by. Thank you.

E.- No leaks around the gland seal on number two general service pump. The pump is operating normally, Sir.

Synopsis:

Arranging for transfer rate. Making sure that there is no leakage. Expressing a request. Giving advice.

A.- Well, chaps, it's time to begin delivery. Hey, Migel, start at slow rate. Please, mind the pressure, not more than a half kilogram per square centimetre.

B.- O.K. I'm turning the pump on.

C.- I say, Igor, the connection seems to be ship-shape (in good order). There's no fuel leakage around between the flanges. May we go?

A.- Will you wait a few minutes, please. We are going to increase delivery pressure and see if there is no trouble... Hey, Migel, increase pressure. Please don't exceed one and a half kilograms.

B.- O.K. I'm increasing pressure up to 1,5 kg/cm²... Hey, Igor, the pump is at the desired mode of operation, 1,5 kilograms. Is everything O.K.?

A.- Yes, everything seems to be all right. Now you are going on pumping at this pressure. Well guys you may go now. Thank you for cooperation.

C.- Igor, could you get me some 5 kilograms of heat –resistant paint, please?

A.- I'm afraid, I can't. You'd rather talk to the boatsswain. He's over there. Perhaps he'll be able to help you.

C. – Thank you anyway.

SUPPLEMENTARY READING

Read and understand the article. Prepare rendering of it using the phrases from APPENDIX II.

MAN ES DUAL-FUEL ENGINES RACK UP 1 MILLION OPERATING HOURS

02 Apr 2020

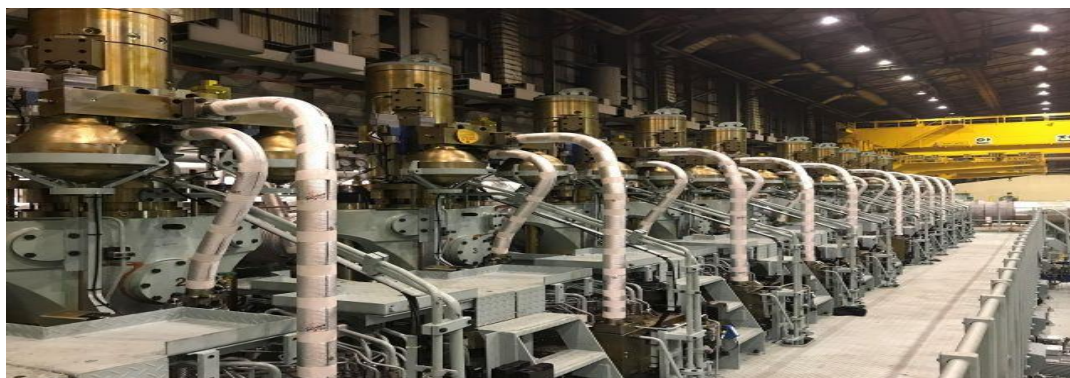
MAN Energy Solutions' portfolio of two-stroke, dual-fuel engines has reached the 1 million operating hours milestone. The company also confirmed its recently announced sales of engines running on LNG or alternative fuels such as LPG, ethane and methanol had reached 6.3 GW, or 300 engines.

Bjarne Foldager, Senior Vice President, Head of Two-Stroke Business at MAN Energy Solutions, attributed the achievement to the company's decade-long dual-fuel strategy. "Our engines' efficiency is the best in the market, which gives shipowners enormous flexibility, and we note that all fuel modes are employed."

Foldager reiterated MAN ES's determination to maintain a dual-fuel focus, citing product developments such as the Mk II ME-GI engine, which included a number of innovative features, such as a [Pump Vaporizer Unit](#), and Pilot Booster Injection Valve, along with continuing development of an Otto-cycle variant, [ME-GA](#).

"With references in every major, marine segment, our dual-fuel portfolio can rightly be considered as mature technology. Our dual-fuel engines continue to act as standard bearers for environmentally friendly, reliable propulsion technology with their seamless switching between fuels and elimination of methane slip. Furthermore, their use of the Diesel combustion principle ensures that they can easily adapt to run on whatever fuels the industry may prefer in the future."

(from <https://www.motorship.com/news101/lng/man-es-dual-fuel-engines-rack-up-1-million-operating-hours>)



Unit 11

GRAMMAR	REVISION
SPEAKING	TROUBLESHOOTING OF DIESEL ENGINE
SUPPLEMENTARY READING	WARTSILA SHAFT LINE REPAIR SERVICES: PEOPLE BEHIND THE PROCESS

GRAMMAR

Revision

Task 1

In the right – hand column containing repair list sentences, find the proper equivalent that will match each individual sentence from the left-hand column

1. Автоматическая телефонная станция	a) Cables running between the sensors and distributing boxes to be renewed.
2. Изготовить коробки для розеток берегового телефона	b) Exchange to be opened up, all parts and units to be blown down and washed out, defective parts to be renewed with spares.
3. Вскрыть станцию, все узлы и детали очистить, продуть и промыть, дефектные детали заменить запасными.	c) Automatic telephone exchange.
4. Контакты зачистить и зашлифовать, контактные соединения обжать.	d) Exchange to be adjusted and submitted in operation.
5. Заменить кабельные соединения от датчиков до распределительных коробок.	e) Boxers for shore telephone sockets to be made.
6. Произвести наладку станций, сдать в работу.	f) Contact points to be faced up and polished, contact connections to be crimped.
7. Электро двигатель швартовной лебедки №4 отсоединить, жилы промаркировать.	g) Electric motor to be reassembled, transported back to the ship, refitted in position and submitted to Register in operation, allow for testing of the insulation resistance.
8. Доставить двигатель в цех, произвести его полную разборку, очистить, промыть, просушить, пропитать электроизоляционным лаком обмотки.	h) Brake disks to be inspected, cleaned up and adjusted.
9. Произвести осмотр и чистку дисков тормоза и их регулировку.	i) Bearing lubricant (grease) to be renewed.
10. Заменить смазку подшипников.	j) El.motor of number four mooring winch to be disconnected, conductors (cores) to be marked.
11. Двигатель собрать, доставить на судно, установить на место, измерить сопротивление изоляции, сдать в работу Регистру.	k) Motor to be transported to the workshop, overhauled, cleaned up and washed out, winding to be impregnated with insulating varnish.

SPEAKING

Study the information from the table TROUBLESHOOTING OF DIESEL ENGINE

<i>What's the problem</i>	<i>Cause</i>	<i>Where to look</i>	<i>What to do</i>
<i>Engine refuses to start</i>	No fuel	Supply tank Supply tank valve	Fill tank Open valve
	Starting air pressure too low	Starting air pressure gauge	Start air compressor Recharge reservoir
	Air in fuel line or pump	Fuel pump	Prime fuel pump Check line for leaks
	Injection nozzles not working	Nozzles	Remove injectors and clean Examine spring
	Compression low	Valves Pistons	Examine to see if seating properly, Examine piston rings, If supercharged, inlet filter could be dirty
	Viscosity of oil too high	Fuel tank	Put on heating steam Circulate fuel lines
	Cylinder too cold	Cylinder cooling water pump	Cooling water may need heating
	Injection timing wrong	Fuel pump	Adjust
<i>Engine starts on air but refuses to pick up firing</i>	Valve open	Inlet exhaust valve	Free if stuck
	Fuel system air locked	Fuel pipes	Prime fuel pumps and test
	Filter choked	Fuel filter	Turn on # 2 filter Clean #1 filter
	Fuel injector filter choked	Fuel injector	Remove filter Fit spare filter
	Fuel pump set incorrectly	Fuel pump timing gear	Reset fuel pump
	Level of oil in service tank too low	Service tank gauge	Refill service tank and prime fuel pumps
<i>Engine slows down or stops</i>	Governor gear defective	Governor and linkage	Check setting of governor
	Fuel injector delivering too little fuel	Fuel pump injector	Adjust Put in new injector
	Water in fuel oil	Filter	Turn on #2 filter Clean #1 filter
	Overloading	Gauges	Look at all gauges Reduce load
	Unequal load being developed in one cylinder	Exhaust temperatures	Adjust fuel supply to low cylinder Check injector nozzle and fuel pump delivery valve
	Stoppage of cooling water	Circulating pumps	Regrind pump gland Reset heat exchanger thermostat
<i>Engine runs fast</i>	Governor gear out of order	Governor and governor links	Clean oil and reset Check connections
	Fuel pump not responding to governor	Fuel pump	Examine fuel pump to governor joint
<i>Engine works irregularly</i>	Governor gear out of order	Governor and linkage	Examine, clean and oil
	Water in fuel	Fuel filter	Replace filter
	Overloading	All gauges	Adjust where necessary
	Fuel pump valve leaking	Fuel pump	Delivery valve may be stuck open
	Fuel pump sticking	Fuel pump	Check spring Clean pump plunger
	Fuel delivery differs	Injectors	Adjust until all inject at same pressure

Study the dialogue. Make use of the vocabulary after the dialogue.

GENERAL INFORMATION ABOUT THE NECESSARY REPAIRS

Mr Smith: How do you do. I'm Robert Smith from the shiprepairing company. We've got your cable that your ship needs some repairs and I'm here to discuss the matter.

Captain: How do you do. I'm the Captain. My name's Ivanov. And this is Mr. Petrov, my Chief Engineer.

Mr Smith: Well, what's the trouble? Please tell me what kind of repairs do you need?

Chief Engineer: You see, something's happened to our trawl winch. It's out of order. As far as I understand the bronze bearing of the warp drums should be replaced.

Mr Smith: Is there anything else to be repaired besides the trawl winch?

Chief Engineer: Oh yes. There are some minor repairs to the main engine and the steam boiler to be made.

Mr Smith: What's wrong with your main engine?

Chief Engineer: You see, the expansion joints connecting the turbocharger and the exhaust manifold are out of order. To our regret, there are no spare expansion joints on board to replace the failed ones. We've tried welding but with poor results.

Mr Smith: Well, that's clear. And what's the matter with your steam boiler?

Chief Engineer: I think it's necessary to replace the fuel-oil priming pump and to overhaul the feed pump valve chest as well.

Mr Smith: In order to determine the scope of repairs I'd like to survey the damages. Will you show me the way, please?

Chief Engineer: Oh yes, of course. Follow me, please.

VOCABULARY

Emergency repair	аварийный ремонт
Cable	радиограмма
Warp drum	ваерный барабан
Expansion joint Exhaust manifold	компенсатор выхлопной коллектор
Fuel-oil priming pump	топливноподкачивающий насос
Valve chest	клапанная коробка
In order to	для того чтобы
To determine	определять
Scope	объем

SUPPLEMENTARY READING

Read and understand the article. Prepare rendering of it using the phrases from APPENDIX II.

Wärtsilä Shaft Line Repair Services: people behind the process

27 Nov 2019

In the event of a major incident, such as a collision, grounding, fire or a flood, a quick and targeted response is critical in avoiding and maintaining damages. To mitigate risks like these, Wärtsilä Seals & Bearings offers a range of specialist services under the solution – Wärtsilä Shaft Line Repair Services.

To help reduce further damage and ensure safer operations for the future, Wärtsilä Seals & Bearings provides a centralised, cross-functional project management approach. Our approach relies on positioning alignment specialists, project managers and our wide product portfolio and service network at the right time and place to ensure customer needs are efficiently addressed.

Typically, customers contact us when they are experiencing a problem with their shaft line. This can range from hearing a noise along the shaft line, vibrations on components, a leaking seal or a worn or overheating bearing. When addressing an incident, alignment specialists provide expert investigations which allows Wärtsilä to accurately determine the work which needs to be performed on a shaft line.

The team consists of analysts and specialist service engineers who have experience working on complete shaft lines and associated equipment. Through specialist training provided by Wärtsilä, engineers develop their skills and expertise to become qualified alignment engineers. They are supported by our global team, who are experts at diagnostics, analytics, calculations and measurements. Our specialists can be deployed within hours of being contacted by the customer and are in constant communication with project managers to support the project.

Following this, our project managers co-ordinate the repair by ensuring all necessary parts and services required for the repair are scheduled and delivered efficiently to limit customer costs and ensure the vessel is back in operation as soon as possible.

Our competitive edge is founded on having one of the widest product and service portfolios on the market. This, combined with having a strategic footprint in our manufacturing plants enables us to produce products and spare parts locally and deliver them quickly to site. Our wide and global reach of service engineers means we can provide resources at the right place and time. Through Wärtsilä Shaft Line Repair Services, we pull all these elements into a project in order to deliver very efficiently for our customers.

In addition to reactive services for urgent issues, we also provide preventative services such as our Wärtsilä Portable Condition Based Monitoring System. This service enables customers to investigate the alignment of their shaft line without taking the vessel out of operation. We install the equipment and it monitors the shaft line for a usual sailing under all normal operating parameters and conditions of the vessel. The data is then analysed, and a report of recommendations is sent to the customers on any work required.

Wärtsilä Shaft Line Repair Services is focused around providing fast, efficient and project-managed shaft line solutions. We would encourage vessel owners and operators to contact us should they be experiencing even what they might feel are minor issues, such as noise and vibration, as these can lead to much bigger problems if not addressed.

Unit 12

GRAMMAR	REVISION
SPEAKING	SAFETY
SUPPLEMENTARY READING	EXPLOSION SAFETY FOR DUAL -FUEL AND LNG ENGINES

GRAMMAR

Revision

Task 1

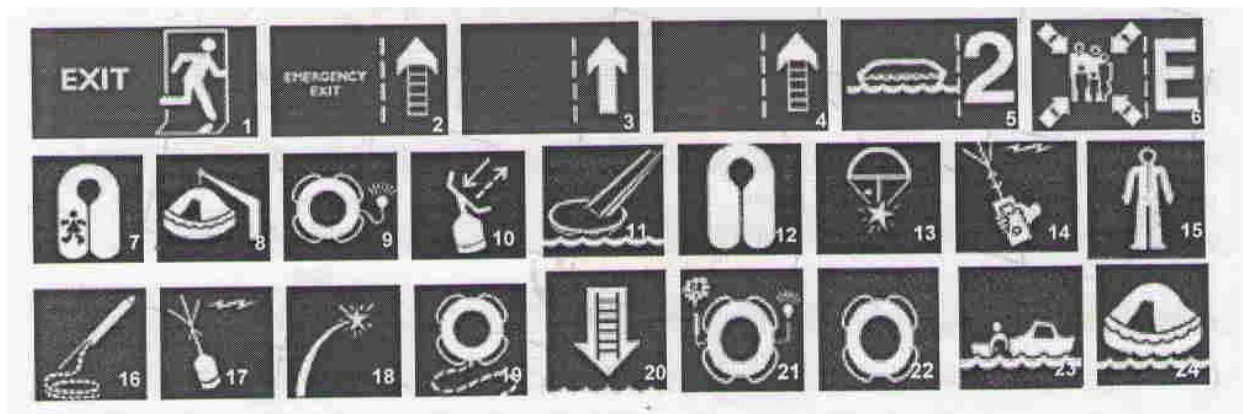
In the right – hand column containing repair list sentences, find the proper equivalent that will match each individual sentence from the left-hand column

1.Изготовить по образцу кожухи для двигателей швартовых лебедок, установить на место, сдать заказчику.	a. Radar to be mounted; an additional mast for the device “A” to be made and fitted; placing in service and field adjustment (commissioning) to be performed.
2.Демонтировать прожектора аварийного освещения шлюпок, разобрать, очистить, покрасить, установить на место, заменить питающий кабель.	b. Casings for the el.motors of the mooring winches to be made to model, painted, fitted in position and submitted to crew.
3. Вскрыть кабельную трассу на гл. палубе, продуть, просушить, оббить ржавчину, восстановить герметичность, покрасить.	c. General wired-radio relay service to be adjusted. Circulator and public broadcasting lines to be tested separately.
4.Произвести монтаж РЛС, изготовить и установить дополнительную мачту для прибора «А», произвести пуско-наладочные работы.	d. Search lights of the emergency boat lighting to be removed, dismantled, cleaned, painted and refitted;power cable to be replaced.
5.Произвести наладку общесудовой трансляции. Проверить раздельно в работе по линиям циркуляра и широкоэвещательных передач.	e. Cable routing on the main deck to be opened up, blown through, dried; rust to be removed mechanically; leak-proof to be restored; routing to be painted.

SPEAKING

Safety aboard

Fill in the table below with Russian equivalents matching the picture and words or word-combination in English



1.	Exit	
2.	Emergency Exit	
3.	Direction Indicator	
4.	Emergency Exit Indicator	
5.	Embarcation Station	
6.	Muster Station	
7.	Child's life jacket	
8.	Davit-launched Life Raft	
9.	Life Buoy with light	
10.	Radar Transponder	
11.	Evacuation slide	
12.	Life Jacket	
13.	Rocket Parachute Flares	
14.	Survival Craft Portable Radio	
15.	Immersion Suit	
16.	Line-throwing Appliance	
17.	EPIRB	
18.	Survival Craft Pyrotechnic Distress Signals	
19.	Life Buoy with Line	
20.	Emergency Ladder	
21.	Life Buoy with Light and Smoke	
22.	Life Buoy	
23.	Rescue Boat	
24.	Life Raft	

INSTRUCTIONS FOR LIFE RAFT USE

How to survive in a life raft:

- Identify a person in charge of the life raft.
- Post a lookout.
- Issue anti-seasickness medicine and seasickness bags.
- Dry the life raft floor.

- Provide the first aid if necessary.
- Manoeuvre towards other life rafts, secure life rafts together.
- Arrange watches and duties.

Duties –Outside: lookout for searching ships and aircraft, survivors in water.

Duties- Inside: gather useful floating objects, maintain the life raft, check the sea anchor and look after the equipment.

- Check the life raft for correct operation and remove any problems if possible (ventilate if CO₂ leaking into the life raft).

- Prepare to use radio and other detection equipment.
- Protect against cold and wet conditions.
- Decide on food and water rations.
- Take measures to maintain morale. High morale and will to live are very

important if a person must survive after abandoning a ship. Discipline is also important inside the life raft. Fear comes only if you don't have enough knowledge about the life raft and its equipment and your chances of rescue.

- Make proper use of available survival equipment.
- Prepare actions for:
- Arrival of rescue units;
- Rescue by helicopter;
- Towing
- Landing

SKIN AND EYE CONTACT WITH PAINT

If paint is spilled:

- Ventilate the area to remove the fumes.
- Mop up all paint with absorbent material, and then dispose it in closed metal containers.

To prevent paint coming into contact with skin and eyes:

- Wear working clothes that cover as much body as possible.
- Always wear gloves and eye protection, also when you chip before painting.
- Do not touch your mouth or eyes with gloves.
- Read and follow precautionary measures on paint containers.

Eyes are very sensitive, so if paint or thinner splashes into your eyes wash your eyes immediately with fresh water for at least 10 minutes. It may be also necessary to see the doctor. If paint gets on your skin, remove it with soap and water or an industrial cleaner. NEVER USE SOLVENT.

Remember it is most important to avoid skin contact. If your clothes become soaked in paint, change them immediately and carefully wash with soap and water.

MAN OVERBOARD

This can happen any time. If someone falls overboard it's necessary to take an immediate action. First, shout "Man Overboard" and throw him a life buoy. A life buoy or a life jacket will help the man overboard to survive until he is rescued. To make the rescue operation possible and fast, it's necessary to inform the bridge and the watchkeeping officer as soon as possible. Make sure that the watchkeeping officer gets your message about the man overboard. The watchkeeping officer will inform the Captain and will take an immediate action. He will turn or stop the ship to rescue the person as soon as possible. If necessary he will send a distress message to other ships in the area and Rescue Center, so that they can help in the rescue operation. Then the officer will give the command to prepare a rescue boat to bring the person onboard back again. After this the rescued man should be taken to the sick-bay immediately.

If you get overboard get clear of the ship and continue shouting and splashing water as long as there is a chance that you will be heard or seen. Then swim on your back to keep your body warm. Do not panic!

ABANDON YOUR SHIP

If for some reason a ship is going to sink the crew must abandon it. Only the Master can decide when and if the ship will be abandoned. He will give the command: "Prepare to abandon the ship on the starboard (or port) side". Put on your life jacket and run to the muster station for starboard (port) side where lifeboats and life rafts are.

When the ship is abandoned everything possible will be done to rescue the crew as soon as possible.

dry powder	порошок
emergency alarm	сигнал тревоги
fire extinguisher	огнетушитель
foam	пена
to extinguish fire	гасить, тушить пожар
to evacuate	эвакуировать
fire alarm	пожарная сирена
first aid box	аптечка
to launch	спускать
life buoy	спасательный круг
life jacket	спасательный жилет
life raft	спасательный плот
life saving equipment	спасательное оборудование
muster list	расписание по тревогам
muster station	место сбора

Read and translate the texts General Drills, Fire using the words below

VOCABULARY

drill	тренировка, учебная отработка действий
aboard ship	на судне
to be designed	быть предназначенным
to handle	справится с
emergency	авария, непредвиденный случай, чрезвычайное обстоятельство
to move	переходить
station	место, позиция, пост
important	важный
clearly	ясно, четко, отчетливо, понятно
to state	констатировать, формулировать, излагать
muster list	расписание по постам (на случай аварийной или пожарной тревоги и шлюпочных учений)
to excuse somebody from something	освободить кого - либо от чего - либо
unless	если не
permission	разрешение, позволение
to grant	выдавать, удовлетворять
department head	начальник службы
to familiarize themselves	ознакомиться
location	местонахождение, размещение
emergency stations	аварийные посты
upon reporting	по прибытии
provide	давать, снабжать, обеспечивать
muster list card	карточка со сведениями из аварийного расписания
to perform	выполнять, исполнять, работать
must be instructed	должен пройти инструктаж
to be held	проводиться
to cope with	справиться, совладать с
alarm	боевая тревога, сигнал тревоги
rapid	быстрый, стремительный
ringing	звон, звонок
ship's bell	судовой колокол, сигнальный звонок
announcement	объявление, сообщение, извещение
public address system	судовая трансляционная сеть
purpose	цель
assume	предполагать, допускать
specific	определенный
means	средство, способ
at hand	под рукой
promptly	немедленно
to extinguish	тушить, гасить
to respond	реагировать на
in accordance with	в соответствии с
squad	команда, группа, партия отряд
steward's department	служба заведующего хозяйством
embarkation station	место посадки
fire pump	пожарный насос
watertight door	водонепроницаемая дверь
port	иллюминатор, лацпорт
air shaft	вентиляционная шахта
fan	вентилятор
blower	воздуходувка, компрессор
fire hose	пожарный рукав
to lead out	разнести, раскатывать, развернуть
affected area	аварийная зона

General drills aboard ship are designed to prepare the crew to handle emergencies.

By using a standard system of drills it is possible for a man/woman to move from one ship to another and still know what to do in an emergency. You must know exactly where your station is and what your job is for each drill or emergency. This important information is clearly stated on the MUSTER LIST.

No one is excused from any drill unless permission has been granted by the department head.

All crewmembers must familiarize themselves with the location and duties of their emergency stations upon reporting on board. Each crewmember is provided with an individual muster list card, which shows in detail the special duties to perform.

All crewmembers must be instructed in the performance of their special duties. Crew on watch/watchkeepers will remain on watch on signal for Emergency Drill.

So, drills are held to train you to cope with real emergencies. Muster List tells you where to go and what to do in a drill or emergency.

Fire

Alarm for a real fire may be given at any time and it will be rapid ringing of the ship's bells (continuous ringing of the General Alarm Bells for a period of at least 10 seconds). An announcement is made twice over general announcing system/public address system.

For drill purposes a fire may be assumed to be in a specific place.

The person who discovers an actual fire must give the alarm. He/She must use any means at hand to spread the alarm.

Once the alarm has sounded personnel nearby should act promptly to check or extinguish the fire. All other crew members respond to the alarm in accordance with the Muster List.

Emergency squad/party will assemble with equipment immediately upon the Emergency Signal.

Steward's department will assemble and direct passengers, properly dressed and wearing life jackets, to embarkation stations.

Immediately upon the Fire and Emergency Signal fire pumps must be started, all water doors, ports and air shafts must be closed and all fans and blowers stopped. Fire hoses must be led out in the affected area.

Task 2

Match the question and the answer

1. How will you prepare a fire hose for use?	a) They are designed to prepare the crew to handle emergencies.
2. What must be closed upon the fire signal?	b) They are stated on the Muster List.
3. When must fire pumps be started?	c) I shall familiarize myself with my emergency stations and duties described on my muster list card.
4. What must you do in fire drill or emergency?	d) No, they remain on watch.
5. What devices are used to give an alarm signal on board?	e) It tells me where to go and what to do in a drill or emergency.
6. What do you learn from the Muster list?	f) General alarm bells and public address system are used to announce an alarm.
7. Do watchkeepers participate in emergency drills?	g) I shall respond in accordance with the Muster List.
8. With what will you have to familiarize yourself upon reporting on board?	h) Immediately after the fire alarm signal has been given.
9. Where do you find the description of your drill or emergency stations and duties?	i) Watertight doors, ports and air shaft shall.
10. What are general drills aboard ship designed for?	j) I shall run it out.

Task 3

Read the vocabulary below and speak about stations and duties of the Engine Department according to the Muster List (extracts)

Fire and emergency station	пост по пожарному и аварийному расписанию
Life line	спасательный леер
spanner	гаечный ключ
Steam smothering manifold	тушение пожара паром
wrench	коллектор, магистраль, разветвленный трубопровод
Fire hydrant	гаечный ключ
Lead out	пожарный кран
messenger	разнести
Store keeper	посыльный
Gas mask	заведующий складом, кладовщик
oiler	противогаз
Shaft alley	моторист первого класса
wiper	коридор гребного вала
To assemble	обтирщик, моторист второго класса
galley	собирать
secure	камбуз
utility man	закреплять, сохранять
messman	подсобный рабочий
abandon ship	рабочий по столовой
gripes	покидать судно
	найтовое крепление шлюпки

to attend	обслуживать какое –либо устройство
after fall	кормовой фал
plug	пробка
guy	оттяжка
davit	шлюпбалка
painter	фалинь
fitter	слесарь
boat chocks	шлюпочные киль-блоки
embarkation ladder	посадочный шторм-трап

	Rank	Fire and Emergency Station and Duty	
Deck Department			
7	Boatswain	Emergency squad. Provide life line.	
8	Helmsman	On the bridge. Relieve the wheelman.	
9	Helmsman	Emergency squad. Provide fire extinguisher	
10	Able Seaman	Emergency squad. Provide extra length of hose and spanner.	
11	Able Seaman	Emergency squad. Provide steam smothering manifold wrench	
12	Able Seaman	Main deck forward fire hydrants. Stand by to lead out hose.	
17	Ord.Seaman	On the bridge.Act out as messenger.	
18	Ord.Seaman	Boat deck fire hydrants.Stand by to lead out hose.	
Engine Department			
26	Store keeper	Emergency Squad. Provide gas mask.	
27	Oiler	Starboard shaft alley watertight door. Close and stand by.	
29	Oiler	Engine Room. Assist at fire pumps.	
30	Oiler	Engine Room. Assist at CO ₂ fire extinguishers.	
31	Oiler	Engine Room.Stand by with foam fire extinguisher.	
39	Wiper	Main deck amidships. Outside fire hydrants. Starboard side. Stand by and assist.	
Stewards' Department			
41	Steward	Boat deck. Assemble and assist passengers.	
42	Chief Cook	Galley.Secure and stand by.	
43	2 nd Cook	Main deck amidships. Close all ports and doors, starboard side.	
44	Utility Man	Main deck amidships. Close all ports and doors, starboard side.	
45	Messman	Sallon Deck amidships. Close all ports and doors port side.	
46	Messboy	Crew messroom. Close ports and doors and stand by.	
Abandon Ship-Boat Stations			
	Rank	Boat number	Duties
Deck Department			
6	Carpenter	2	Release inboard gripes and attend after fall
7	Boatswain	1	Release inbord gripes and arrend forward fall.
8	Helmsman	1	Secure plug and attend after fall.
11	Able Seaman	1	Release outboard gripes and attend forward guy
13	Able Seaman	3	Release outboard gripes and turn out forward davit

17	Ord.Seaman	1	Lead out and attend painter
<i>Engine Department</i>			
27	Oiler	1	Attend forward guy
30	Oiler	3	Turn out after davit
34	Fitter	1	Release boat chocks
<i>Stewards' Department</i>			
41	Steward	1	Assemble and assist passengers
42	Chief Cook	2	Secure embarkation ladder and assist passengers
43	2 nd Cook	3	Lead out and attend painter.
45	Messman	3	Turn out forward davit
48	Mess boy	4	Turn out after davit.

Task 4

Study the following Fire Fighting –and –Drill Phrases

Smoke/fire/explosion in engine room.	Дым, пожар, взрыв в машинном отделении
What is on fire?	Что горит?
Fuel on fire	Горит топливо
No information	Информации нет
No, fire not under control yet	Нет, пожар еще не находится под контролем
Pressure on fire mains	Дать давление в пожарные магистрали
Fire mains under pressure	Пожарные магистрали находятся под давлением
Fuel stopped	Подача топлива прекращена
Hatch covers closed	Крышки люков закрыты
Ventilators switched off	Вентиляторы выключены
Alter course to 82° (zero eight two)	Измените курс на 82°
Course altered to 82°	Курс изменился на 82°
Fire party/rescue team/first aid team standing by	Пожарная партия/спасательная команда/команда по оказанию первой помощи готова
CO ₂ station/emergency generator standing by.	Углекислотная установка/аварийный генератор готов(а)
Start fire fighting	Начинайте тушить пожар
Go through engine room/superstructure/accommodation	Идите через машинное отделение/надстройку/жилое помещение
Go from port side/starboard side to manhole	Идите с левого борта/правого борта к горловине
Have lifeline between each other/to outside	Иметь страховочный конец между людьми /выведенным наружу
Maintain radio contact on VHF channel 15/17	Поддерживать радиосвязь на канале 15/17 УКВ
Fire party must have protective clothing /smoke helmets	Пожарная партия должна иметь защитную одежду/противодымовые шлемы.
Use water/foam/powder/CO ₂ gas/sand/blankets for the fire in the superstructure/ER	Использовать воду/пену/порошок/углекислый

	газ/песок/кошму при пожаре в надстройке/МО
Run out fire hoses	Разнести пожарные рукава
Fire hoses are run out	Пожарные рукава разнесены
Water on	Дать воду
Water is on	Дали воду
Water not on	Воду не дали
Cool down bulkheads to engine room with water	Охлаждать водой переборки машинного отделения
Is fire extinguished?	Пожар потушен
Yes, fire extinguished	Да, пожар потушен
No, fire not extinguished	Нет, пожар не потушен
Fire restricted	Пожар локализован
Fire extinguishing systems/means remain on stand-by	Системы/средства пожаротушения в состоянии готовности
Rope –off fire area and report	Оградить леерами участок пожара и доложить!
Fire area roped -off	Участок пожара огражден леерами
Fire alarm cancelled	Отбой пожарной тревоги

Task 5

Study the Safety Signs below:

Danger-High Voltage	Опасно! Высокое напряжение
Danger-No smoking, Matches or Open Light	Опасно! Не курить, не пользоваться спичками и открытым огнем
Danger-Open Floor Plates	Опасно! Снять плиты настила
Danger-men working on line	Опасно! На линии работают люди
Danger-men working near propeller	Опасно! В районе гребного винта работают люди.
Caution-wear goggles while grinding	Предупреждение! При работе на шлифовальном станке наденьте защитные очки
Caution –wear goggles while chipping	Предупреждение! При скалывании носите защитные очки
Caution-shut off power before working on machines	Осторожно! Отключить подачу энергии до начала работы на машинах
Caution –use brush to remove chips	Предостережение! Пользуйтесь щеткой для уборки стружек.
Caution-slippery deck	Осторожно! Скользящая палуба
Caution-hook door open before passing stores through	Предупреждение! Прежде чем зайти в склад зафиксируйте дверь крючком в открытом положении
Caution-put guard in place before operating	Предупреждение! Установите решетки ограждения на место до начала работы
Safety first-wipe up spills at once	Безопасность прежде всего- подотрите пролитую жидкость сразу/немедленно.
Be careful-keep one hand on railing	Осторожно! –Держитесь одной рукой за поручень/перила

SUPPLEMENTARY READING

Read and understand the article. Prepare rendering of it using the phrases from APPENDIX II.

EXPLOSION SAFETY FOR DUAL-FUEL AND LNG ENGINES

01 Oct 2019

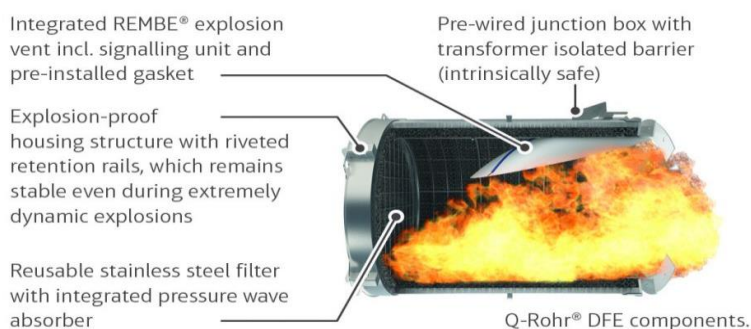
Flameless venting technology protects the exhaust system of the ship engine

The Q-Rohr DFE from the German manufacturer REMBE GmbH Safety & Control, explosion safety expert, is an explosion safety system specially designed for LNG- and dual-fuel engines.

Gas-powered engines and the connected exhaust system carry a major risk of explosion. This may be caused, among other things, by possible misfiring or not starting of the engine whereby a combustible gas-oxygen mix may reach the exhaust system. Sources of ignition mostly include hot surfaces on the engine side or from SCR-catalyst. When an explosive gas /air mixture meets with a source of ignition, there is the risk that an explosion generates where pressure and flames will spread very quickly within the pipeline sections, thus usually causing damage or even uncontrolled destruction of weak structures like expansion bellows, SCR-catalyst or boilers. This risk can lead to loss of maneuverability, devastating injuries and maritime distress.

The Q-Rohr DFE is installed on the exhaust system of an engine. If an explosion occurs, the stainless steel mesh filter of the Q-Rohr DFE absorbs pressure and flames of the explosion. Plants and personnel in the engine room are optimally protected.

Important for ship operators: After an incident, the explosion vent panel in the Q-Rohr DFE can simply be replaced and operation can be resumed.



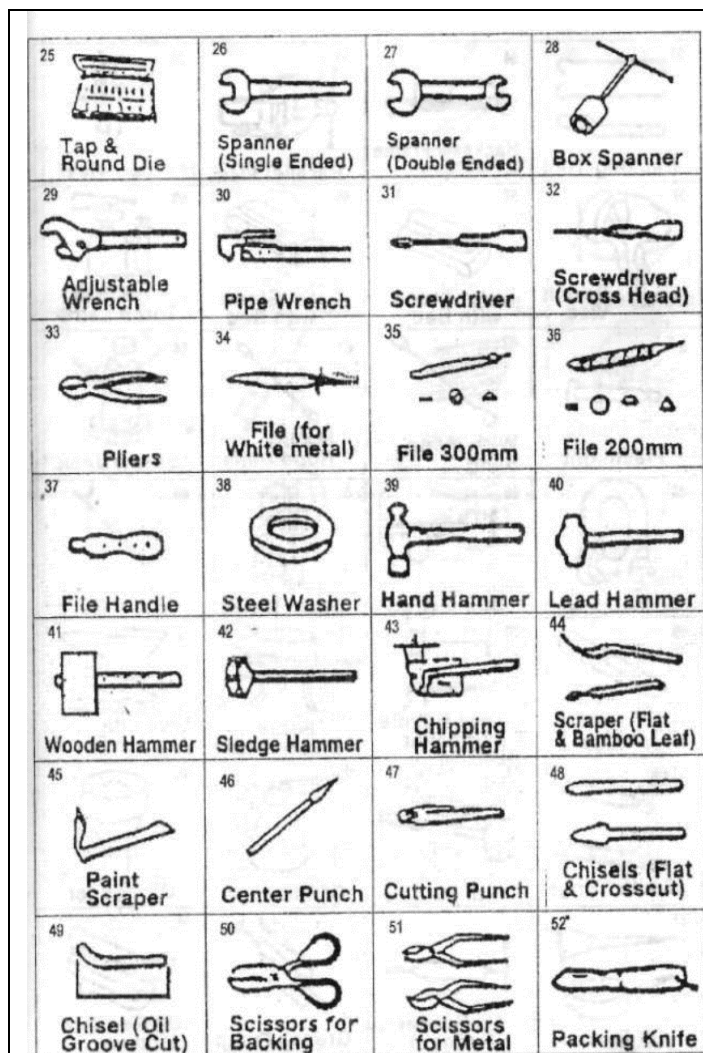
(from <https://www.motorship.com/press-releases/2019/explosion-safety-for-dual-fuel-and-lng-engines>)

APPENDIX I

Additional vocabulary

1  Dial Gauge	2  Micrometer (Outside)	3  Vernier Calipers	4  Tachometer
5  Clinometer	6  Marking Scriber	7  Surface Gauge	8  Surface Plates
9  Straight Edge	10  Square	11  Feeler Gauge	12  Steel Scale
13  Measure for Sounding	14  Cloth Tape Measure	15  Spring Balance	16  Inside Calipers
17  Outside Caliper	18  Compass	19  Thermometer With holder	20  Thermometer 100 °C Alcohol
21  Thermometer 500 °C Mercury	22  Portable Grinder	23  Portable Electric Drill	24  Straight Shank Drill

- 1.циферблатный индикатор
- 2.микрометр для измерения наружных диаметров
- 3.штангенциркуль с нониусом
- 4.тахометр, счетчик числа оборотов
- 5.клинометр
- 6.чертилка, разметочный инструмент
- 7.рейсмус
- 8.разметочная плита
- 9.поверочная линейка
- 10.угольник
- 11.щуп для измерения зазоров
- 12.стальная масштабная линейка
- 13.лента для измерения уровня жидкости в цистернах
- 14.тканевая мерная лента
- 15.тканевая мерная лента
- 16.нутромер
- 17.кронциркуль, толщинамер
- 18.циркуль, буссоль, компас
- 19.термометр с держателем
- 20.спиртовой термометр со шкалой в градусах Цельсия
- 21.ртутный термометр со шкалой в градусах Цельсия
- 22.переносной точильный камень
- 23.переносная электродрель
- 24.сверло с цилиндрическим хвостовиком



- 25.метчик и круглая лерка
 26.односторонний гаечный ключ
 27.двусторонний гаечный ключ
 28.кольцевой (накидной, торцевой) гаечный ключ
 29.разводной гаечный ключ
 30.трубный ключ/клещи
 31.отвертка, шуруповерт
 32.крестообразная отвертка
 33.клещи, кусачки, плоскогубцы
 34.напильник для бабита
 35.напильник
 36.напильник
 37.ручка напильника
 38.стальная шайба
 39.ручной молоток
 40.свинцовый молоток
 41.деревянный молоток, киянка
 42.кувалда
 43.обрубочный молоток
 44.шабер (плоский и в виде бамбукового листа)
 45.скребок для удаления краски
 46.кернер
 47.пробойник
 48.зубило (плоское и для поперечной рубки)
 49.бороздорежущее зубило; канавочное зубило
 50.ножницы для резки материала вкладышей подшипников
 51.ножницы по металлу
 52.нож для резки прокладочного материала



53.инструмент для набивочного материала
 54.ножовка с полотном
 55.параллельные тиски
 56.тиски на ножке
 57.верстачные тиски
 58.абразивный брусок с основанием
 59.абразивный брусок с основанием
 60.паяльная лампа
 61.карманный электрический фонарь
 62.тросовый строп
 63.строп из манильского троса
 64.винтовой домкрат
 65.соединительная скоба
 66.захват
 67.таль, цепной полиспаст
 68.монтажная
 69.клин
 70.клапанный ключ
 71.кузнечный горн
 72.наковальня на деревянном верстаке
 73.кузнечные клещи
 74.кузнечный молот
 75.мера для смазочного масла
 76.приемная воронка для масла
 77.масленка, лубрикатор
 78.масляный шприц
 79.нагнетатель для пластичной смазки
 80.маслосборник с сетчатым фильтром



- 81. ведро для воды
- 82. поволочная щетка
- 83. малярная кисть
- 84. емкость для краски
- 85. молниеотвод
- 86. пневматический шланг с
распылительной насадкой
- 87. гибкий металлический шланг
- 88. брезентовая ткань
- 89. подмости
- 90. алюминиевая стремянка
- 91. изолирующий коврик
- 92. пульт для машинного отделения
- 93. информационная доска
- 94. болт с проушиной, рым-болт
- 95. емкость для отходов, мусорный
контейнер
- 96. болт с гайкой
- 97. шпилька с гайкой
- 98. шплинг, чека
- 99. толстолистовая сталь
- 100. оцинкованный стальной лист
- 101. тонкий медный или стальной лист
- 102. сортовая сталь (прокат)
- 103. стальная проволока
- 104. У-образный купол
- 105. фланец
- 106. П-образный болт

APPENDIX II

SOME USEFUL PHRASES FOR RENDERING OF AN ARTICLE

1. The article is headlined...

The title of the article I have read is...

I have read the article under the title...

2. The author of the article is ...

The article is written by...

It is (was) published/ printed in...

The article published in...(Newspaper) is devoted to...

3. Contents of the article:

a) The author starts by telling the reader that...

b) The author writes (stresses, points out, thinks) that...

....discusses...

...outlines....

...turns attention to...

...reminds us that...

...notes...

...expresses the view that...

... argues that...

... asserts that...

... deals with...

... believes that...

... has words of warning for...

... voices concern about...

... has no doubt that...

... goes so far as to say that...

... gives most prominence to...

c) The article describes...

According to the text...

Commenting on...

Further the author says...

The article goes on to say that...

The author goes on saying that...

We next learn that...

Further we learn that...

d) In conclusion...

The author comes to the conclusion that...

The concluding words are...

At the end of the article the author sums it all up by saying that...

4. The main idea of the article is...

5. My opinion:

I consider the article to be informative (uninformative).

I found the article interesting (important, dull, of no value, and too hard to understand).

The problems touched upon by the author are very actual (not actual).

- The article is about...
- The article deals with...
- The article touches upon...
- The idea of the article can be stated as follows:...
- The purpose of the article is to give the reader some information on... .
- The aim of the article is to provide the reader with some material on... .
- The article raises the problem of... .
- The article touches upon variety of problems.

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