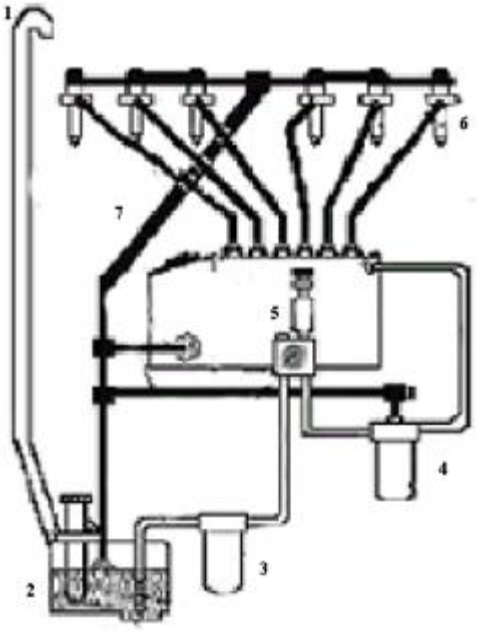
Carry out refuelling questions

Question 1 (1 Mark)



In the fuel system above number 5 is a _____

Question 2 (1 Mark)

When bleeding a fuel system, what is bled off?

a. Diesel
b. Water
c. Air
d. Petrol

Question 3 (1 Mark)

Which of the following is not a routine pre-departure check?

a. Check that the helm will travel from hard over to hard over
b. Check that the oil pressure is correct
c. Check that the stern gland is not to tight
d. Check that the batteries are secure

Question 4 (1 Mark)

Checking the fuel levels is part of the engine room pre-departure checks. (TRUE/FALSE)

Question 5 (1 Mark)

A diesel engine with a turbo charger should be allowed to idle for several minutes before shut down to ensure:

a. That the engine and turbo warm up before shutting down the motor
b. That the turbo keeps spinning after shut down
c. That the engine and turbo cool down before shutting down the motor
d. That all the oil in the motor settles back down in the sump before shut down

Question 6 (1 Mark)

Batteries give off Hydrogen gas during charging (TRUE/FALSE)

Question 7 (1 Mark)

You turn the starter key and nothing happens. The first thing you would check is?

a. The battery master switch
b. The specific gravity of the battery
c. The starter motor
d. The shore power supply

Question 8 (1 Mark)

Back flooding to the bilges is prevented by

a. Both the choices
b. L-Port cock
c. Neither of the choices
d. One way valves

Question 9 (1 Mark)

Which of the following is not required when re-fuelling your vessel

a. Turn off the fuel line shut off valve
b. Prevent people smoking
c. Turn off the LPG system
d. Turn off the battery isolation switch

Question 10 (1 Mark)

Plastic fuel lines are permitted on commercial vessels to allow for the vibrations of the motor. (TRUE/FALSE)

Question 11 (2 Marks)

What are the actions you would take in order in the event of a fuel spill into the water during re-fuelling? Assume you cannot do them all at once.

Question 12 (1 Mark)

The best way to test for a leak in a LPG system is?

a. Smell along the pipes
b. Apply soapy water to the piping
c. Shut down the motor and listen
d. Light a match and look for a small flame

Question 13 (1 Mark)

LPG will collect in the bilges (TRUE/FALSE)

Question 14 (1 Mark)

The gas given off by a battery when it is being charged is?

a. Harmless
b. Toxic
c. Explosive
d. Asphyxiating

Question 15 (4 Marks)

Match the description on the right, with the correct item on the left:

1. Dry Chemical	a. Coloured all red
2. Water	b. Coloured red with a black band
3. CO2	c. Coloured all blue
4. Foam	d. Coloured red with a white band

Question 16 (1 Mark)

In the event of a major engine room fire, which of the following actions would you do first.

a. Close fuel supply valves
b. Activate fixed fire fighting system
c. Shut engine room vents
d. Turn off motor

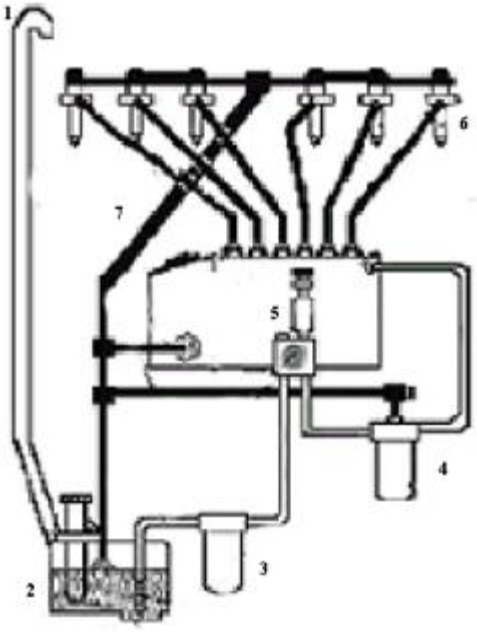
Question 17 (1 Mark)

A Dry Chemical fire extinguisher can be used on almost any fire (TRUE/FALSE)

Question 18 (3 Marks)

What are the actions you would take in order in the event of a serious fire onboard your vessel. Assume you cannot do them all at once.

Question 9 (1 Mark)



In the fuel system above number 1 is a _____

Question 19 (1 Mark)

When bleeding a fuel system, what is bleed off?

a. Petrol
b. Water
c. Air
d. Diesel

Question 20 (1 Mark)

When doing pre-departure checks, the fuel tank?

a. Should be full
b. Should be at least half full
c. Should have enough fuel for the voyage plus 20%
d. Should have enough fuel for the voyage

Question 21 (1 Mark)

The quickest method to stop a small diesel engine whose throttle or governor has become stuck open is to:

a. Smother the air intake
b. Close the fuel supply valve
c. Turn off the ignition switch
d. Apply the shaft brake

Question 22 (4 Marks)

Match the description on the right, with the correct item on the left:

1. Dry Chemical	a. Coloured red with a white band
2. Water	b. Coloured all blue
3. CO_2	c. Coloured all red
4. Foam	d. Coloured red with a black band

Question 23(1 Mark)

The quickest method to stop a small diesel engine whose throttle or governor has become stuck open is to:

a. Close the fuel supply valve
b. Apply the shaft brake
c. Turn off the ignition switch
d. Smother the air intake

Question 24 (1 Mark)

Blue exhaust smoke indicates unburnt fuel. (TRUE/FALSE)

Question 25 (1 Mark)

If the proper equipment isn't available, a battery's charge can be checked by placing a screwdriver across the terminals (TRUE/FALSE)

Question 26 (1 Mark)

Which of the following is not required when re-fuelling your vessel

a. Prevent people smoking
b. Turn off the LPG system
c. Turn off the fuel line shut off valve
d. Turn off the battery isolation switch

Question 27 (1 Mark)

In the event of a fire on board your vessel, your number one priority is:

a. To put the fire out
b. The safety of the vessel
c. The safety of the passengers
d. To send a Mayday call

Question 28 (1 Mark)

A foam fire extinguisher can be used on an electrical fire (TRUE/FALSE)

Question 11 (1 Mark)
Which of the following is not a routine pre-departure check?
Check that morse control is in gear
Check that engine oil level is correct
Check that battery master switch is on
Check that fuel shut off valve is open

Question 29 (1 Mark)

The vessel's fuel tank vent pipe usually terminates:

(a) At the top of the mast
(b) In the engine spaces
(c) Near the exhaust outlet
(d) Above the main deck

Question 30 (1 Mark)

An arrangement for closing off the fuel from a position outside the engine spaces must be provided. The valve is fitted:

(a) At the tank
(b) Between the primary filter and the lift pump
(c) On the engine
(d) After the engine mounted final filter

Question 31 (1 Mark)

Running out of fuel can be serious for the engine for the following reasons:

1. Dirt may enter the fuel supply
2. Water or sludge may enter the fuel supply
3. The fuel injection pump may be damaged
4. The governor may need stripping for cleaning

The correct answer is:

(a) All of the above except 1
(b) All of the above except 2
(c) All of the above except 3
(d) All of the above except 4

Question 32 (1 Mark)

A fuel tank contaminated by “fuel bug” would be indicated by:

(a) Darker than usual smoke from the exhaust
(b) Engine idling roughly
(c) Choked fuel filters
(d) Leaks appearing in the tank sides
(e) Fuel gauges no longer working

Question 33 (1 Mark)

The hand operated fire and bilge pump is fitted:

(a) To provide the service if the power operated pump has been removed
(b) To provide faster bilge pumping when used at the same time as the power pump
(c) To provide the service if the engine is not available
To prime the bilge suction line

Question 34 (1 Mark)

Engine fires are mostly caused by:

(a) Overspeeding
(b) Excessive fumes from the crankcase
(c) Leaking fuel contacting a hot surface
(d) Spontaneous combustion of oil in lagging
(e) Mechanical failure of components

Question 35 (1 Mark)

A “fixed flooding” extinguishing system is:

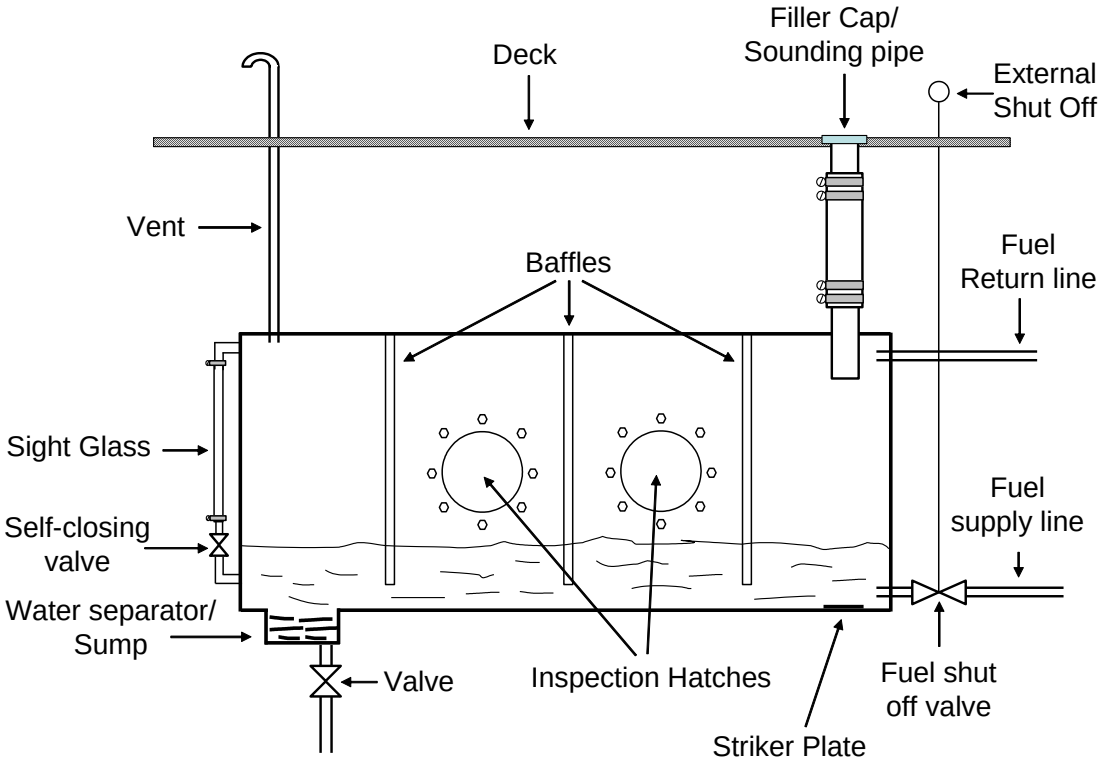
(a) A non-portable extinguishing system
(b) A sea water flooding system
(c) A ventilation isolation system
(d) A fuel tank inert gas flooding arrangement

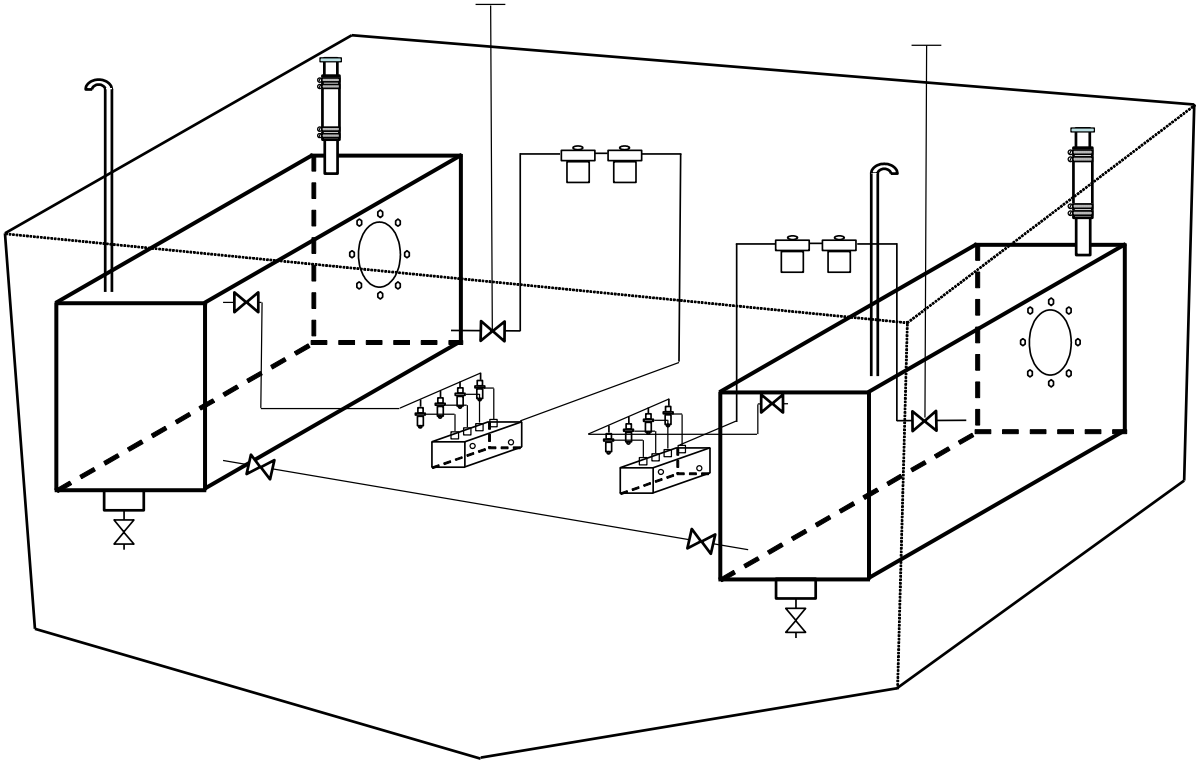
Question 36 (1 Mark)

The following extinguisher is designed to remove oxygen in the fire triangle.

(a) Foam
(b) Water
(c) Dry powder
(d) None of the above

Revision


Filler Cap/
Sounding pipe
Deck
External
Shut Off
Vent
Baffles
Fuel
Return line
Sight Glass
Fuel
supply line
Self-closing
valve
Water separator/
Sump
Valve
Inspection Hatches
Fuel shut
off valve
Striker Plate



Safe Refuelling

Different requirements apply to the installation and refuelling procedures for diesel, petrol and LPG. Special precautions also apply to petrol and LPG so any refuelling spill does not enter the vessel.

Fuel is normally supplied to small vessels from authorised fuel facilities road tanker/s at marinas and wharves for larger vessels. The amount of fuel required can be measured by one of two methods, sounding rod or sight glass. See figure 1. (Note figure 1 depicts both methods. Your vessel will have one or the other not both)

Sounding rods are usually made from wood and normally graduated. It is a simple matter to insert the rod till it hits the bottom of the tank, withdraw the rod and read off the amount left in the tank. If a sight glass is fitted to your vessel you must open the self closing valve first and allow the fuel to equalise with the amount in the tank before taking the reading.

Once you have determined how much fuel is required than the following precautions should be followed.

- No passengers on board during re-fuelling
- Ensure no smoking takes place in the vicinity
- Have suitable fire extinguishers available near the filling station
- Block off freeing ports so spilt diesel fuel on deck can be contained and doesn't go overboard
- Hoist Flag B
- Isolate battery
- Make sure the fuel goes into the correct tank
- Constantly monitor the filling, don't leave it unattended
- Consider stability when filling side tanks
- Supply a container to catch spillage when the fuel supply line is disconnected
- Clean up any spillage immediately
- Ventilate the vessel
- If twin tanks fitted then isolate the tanks. This allows for easing of the pressure in one tank should it be overfilled

If Spillage Occurs

Spillage should not be a common problem, provided care is taken to monitor the fuel supply and the content of the tanks being filled. Fuel spills are a major cause of marine pollution and must be avoided wherever possible through planning and careful operation. If a fuel spill occurs, you should follow these basic steps:

Diesel Fuel Spilled Aboard Vessel

- Stop refuelling
- All steps should be taken to contain spilt fuel on board and away from any source of heat.
- Take fire precautions
- If there is a fuel leak, try to stop any further discharge by whatever means possible. Seek guidance from the vessel's master or assistance, as required.
- Carry out on board clean up. Rags etc used for this purpose must be disposed of properly on shore.

Fuel Spilled Overboard

- Stop refuelling
- Take action to stop any further fuel from entering the water.
- Fire-fighting equipment should be readily available. Ensure fire extinguishers are suitable for use on fuel fires.
- Inform the Fire Brigade and any relevant Port Authority and carry out their instructions
- Advise vessels tied up or moored nearby of the spillage
- Attempt to contain the spread of fuel on the water by laying a floating rope around the spill
- Clean up on board the vessel.
- Never attempt to clean the water by using detergents or similar products
- If the vessel is at sea when the spill occurs, report the matter to the nearest port authority or the state pollution authority.
- If the fuel spill is large, full safety precautions should be exercised. Advise the police

Draining a Fuel Tank

There are occasions when you will be required to drain the contents of a fuel tank. Often this will be a part of maintenance for your vessel, or it may be necessary to remove contaminated fuel from the tank, or as required for survey inspection.

To drain a fuel tank, transfer the contents by pumping the fuel to another tank or tanks. Ensure the second tank contains sufficient space to take the contents of the tank which is being drained.

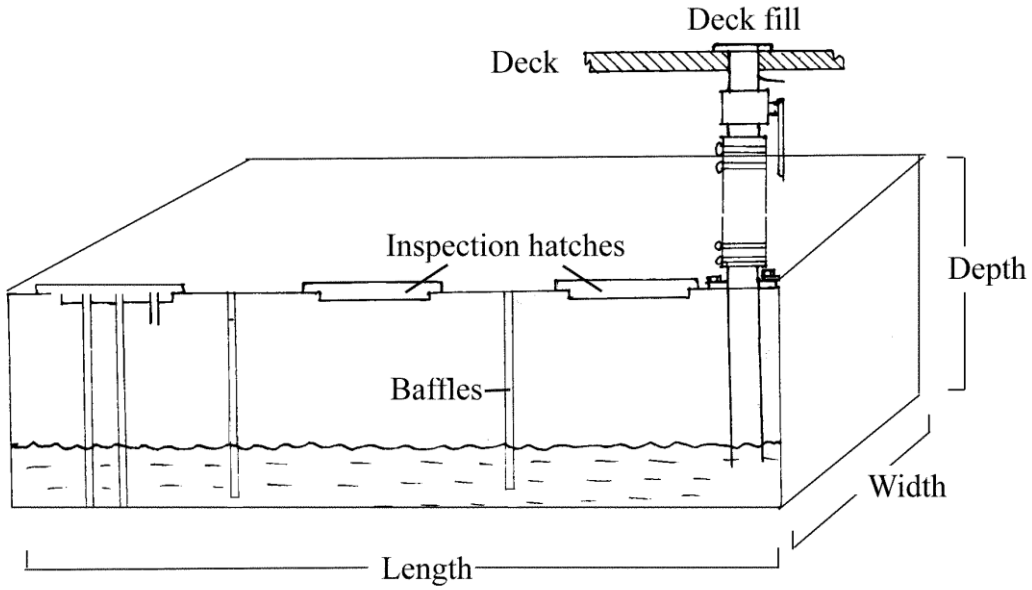
If the vessel has two tanks then its possible to transfer fuel by closing the return line on the tank to be emptied and the feed line on the tank to be filled.

When you have completed the fuel transfer, the remaining fuel from the first tank can be drained into a container. Use the valve normally used for draining water from the tank.

Anytime you handle fuel, ensure that there are fire extinguishers readily available and are suitable for use on fuel fires.

Caution

If the reason for draining the fuel tank is to clean and carry out repairs, the tank will have to be gas-free before a person may enter it. This means obtaining a gas-free certificate. Entering a space that is not tested as gas free is potentially fatal and illegal.



Written activities

Written activity 1

A vessel has a fuel consumption of 14 litres an hour at 8 knots and a fuel capacity of 300 litres.

(a) How many hours can this vessel run considering its capacity?

_____

_____

_____

(b) How far can this vessel travel?

_____

_____

_____

Written activity 2

Try these calculations:

1 If a vessel has a fuel consumption of 8 litres an hour at 6 knots, and a voyage will take 8 hours, calculate the amount of fuel your vessel will require:

_____

_____

_____

2 If a vessel has a fuel consumption of 10 litres an hour at 9 knots, and a voyage will take 4 hours, calculate the amount of fuel your vessel will require:

_____

_____

_____

Written activity 3

1 A vessel has a fuel tank with internal dimensions at:

H = 4.25 m, **W** = 4.25 m and **D** = 1.25 m

Calculate the tank's capacity in cubic metres and in litres.

_____

_____

_____

2 Can you accurately measure a fuel tank's capacity if you are advised of the length, width and depth? What other information, if any, do you require?

_____

_____

_____

3 If a vessel has a fuel tank with a capacity of 4000 litres, a length of 2.95m, a depth of 1.4m and material thickness of 0.02m, calculate the tank's external width.

_____

_____

_____

Written activity 4

1 What is reserve fuel and why do you carry it?

_____

_____

_____

2 Calculate how far a vessel could travel if fuel consumption is 13 litres an hour at 9 knots and a fuel capacity of 280 litres:

_____

_____

_____

3 A vessel has a fuel consumption of 5 litres an hour at 6 knots. A voyage will take 2 hours. A voyage will take 2 hours. How much will this vessel require as a minimum?

_____

_____

_____

4 1 cubic metre =_____ litres.

Answers Written activity 1

Vessel range

(a) Hours the vessel can travel = 300÷14 litres = 21.4 hours
(b) 8 knots x 21.4 hours = 171.2 nautical miles

Answers Written activity 2

Fuel requirements
1 64 litres
2 40 litres

Answers Written activity 3

Calculate fuel tank capacity
1 22.58 cubic metres
2 22578 litres

3 No, you need to know the thickness of the tank material as the internal measurements of the tank will be smaller than the external dimensions. If you use only the external dimensions, you will over estimate the tank's capacity.

External width = 1.05m

Answers Written activity 4

1 Reserve fuel is extra fuel in case conditions or circumstances cause you to run out fuel.

2 280 ÷13 = 21.53 hours
Distance = Speed x Time
= 9 knots x 21.53 hours
= 193.77 nautical miles
3 10 litres
4 1000