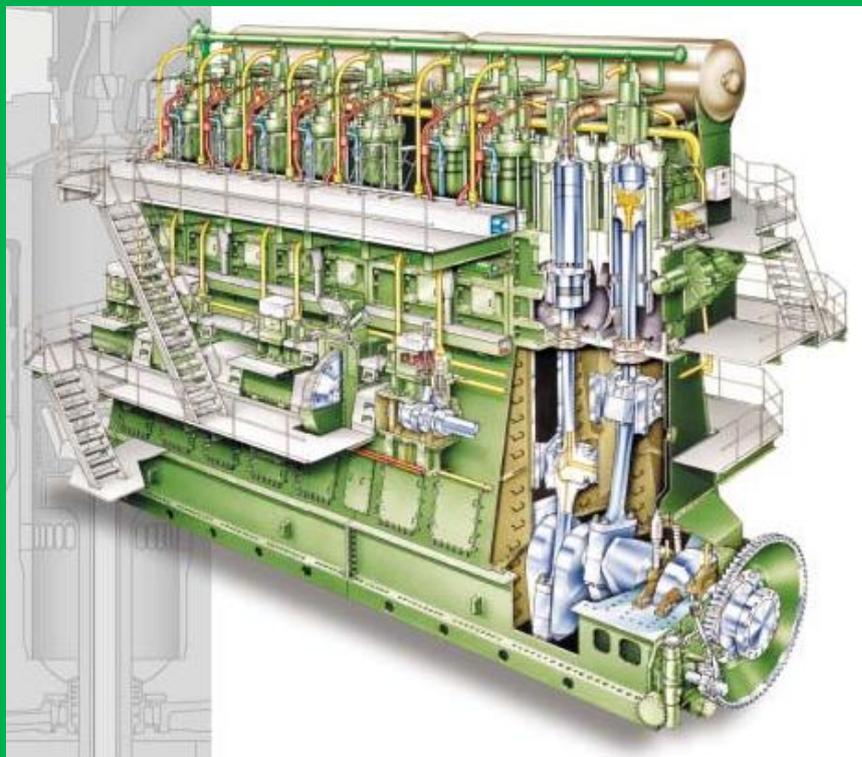


Marine Engineers and Superintendents Technical Support
<http://MarEngine.com>

50 Questions and Answers For Marine Engineers Issue 3



Diesel Engine, Turbocharger, Fuel, Oil

Operation & Service Manuals, and Spare Parts Catalogs <http://engine.od.ua>
Marine spare parts and equipment <http://brovertex.com>

1. An auxiliary engine turbo-charged makes strange noises when the load changes. The engine parameters however are absolutely fine. An external examination of turbocharger parameters as stated in the manual also reveals nothing. Would you do

- A. Continue to run the engine and wait for some time
- B. Stop the engine for a while and make some checks
- C. Reduce the load of the engine
- D. Run it on steady load to make some checks.

(NOTE-this type of Question also asked in Exam just to check your way of thinking)

2. What type of lubricating oils is generally used in auxiliary engines?

- A. Detergent
- B. Alkaline
- C. Synthetic
- D. It is not important.

Answer-A

3. An emergency diesel generator cooling system is equipped with an automotive type thermostat. If the thermostat bellows loses its charge, the thermostat will _____.

- A. open, and the coolant temperature will increase
- B. open, and the coolant temperature will decrease
- C. close, and the engine coolant temperature will increase
- D. close, and the coolant temperature will decrease

Answer-C

4. Why is it essential to renew turbocharger bearings after a preset number of hours of running even if the bearings are in seemingly perfect condition?

- A. Because they are prone to failure due to prolonged exposure to high temperature conditions.
- B. Because they are subject to cyclic loading and are prone to failure due to metal fatigue.
- C. It is not essential to renew if condition monitoring suggests perfect condition.
- D. Lube oil contamination is bound to occur and affect the condition of the bearings

Answer-B (Because bottom end bearing bolts are max amount of fatigue stress)

5. A D/E with full speed rpm of 1000 drives a propeller at 300 r.p.m...what is speed reduction ration?

- A. 0.3 to 1
- B. 3.33 to 1
- C. 33 to 1 hde
- D. 300 to 1

Answer-B

6. Labyrinth seal fitted on the back surface of a compressor wheel of a turbocharger

- A. prevents bearing lube oil contamination
- B. prevents bearing lube oil being sucked in to air stream
- C. helps to keep the shaft cool by controlled leakage of air
- D. none of the above

Answer-May be D but Not Sure(Because Labyrinth seals or glands are fitted to the shaft and casing to prevent the leakage of exhaust gas into the turbine end bearing, or to prevent oil being drawn into the compressor. To assist in the sealing effect, air from the compressor volute casing is led into a space within the gland. A vent to atmosphere at the end of the labyrinth gives a guide to the efficiency of the turbine end gland. Discoloring of the oil on a rotor fitted with a roller bearing will also indicate a failure in the turbine end gland)

7. In the _____ type of t/c 2/s diesel engine is _____ to start.

- A. constant, easier
- B. constant, difficult
- C. pulse, difficult
- D. none

Answer-B

8. The speed of the turbocharger for a four-stroke/cycle diesel engine driving a generator at constant speed depends on the

- A. engine speed
- B. kilowatt load
- C. fuel injection pressure
- D. air intake manifold temperature

Answer-A (Because impulse turbine is used but it may be B also because for Four Stroke the speed will be almost Constant)

9. The purpose of an air cooler in a supercharging system is to:

- A. Reduce temperature of supercharged air in order to condense and remove maximum possible moisture from the air prior entry to the engine
- B. Reduce the temperature of the supercharged air in order to increase the density & also to cool down below dew point to remove moisture from air prior entry to the engine
- C. Cool supercharged air to increase its density such that the dew point is not reached to avoid entry of moisture into the engine
- D. Cool supercharged air to increase its density and also to keep the peak temperature and exhaust gas temperature within limits

Answer-C

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Answer-C

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Answer-C

13. Most T/C have _____ flow type of Compressor and _____ flow type of Rotor

- A. Centrifugal Radial , Impeller axial
- B. Centrifugal axial, Impeller radial
- C. Centrifugal mixed, Reaction Radial
- D. Rotary axial, Reaction Radial

Answer-B ??? (doubt)

14. Modern marine turbochargers use a _____ type of compressor

- A. Radial flow
- B. Axial flow
- C. Mixed flow
- D. Turbulent flow

Answer-B

15. What do you mean by surge limit of a turbocharger?

- A. Characteristic curve of a turbocharger
- B. Portion of compressor characteristic curve which lies on the left side of the point of maximum pressure
- C. A line joining all the points of maximum pressure on compressor characteristic curves , drawn at various speeds of operation
- D. Maximum rpm limit of T/C above which surging will start

Answer-B

16. With full load on the main engine, the RPM for the turbocharger is too low. What may cause this?

- A. The diffuser ring is damaged.
- B. Exhaust temperatures on the main engine are too high.
- C. Dirty nozzle ring.
- D. The lubricating oil pump is malfunctioning.

Answer- C ? (Not Sure)

17. For a main engine fuel system which has a 5 micron filter ,a super decanter is usually fitted _____

- A. before the purifier
- B. after the purifier
- C. after the 5 micron filter to ME
- D. before the horizontal clarifier

Answer-A

18. The timing of the engine is delayed. The exhaust temperatures are high. How would you expect this to affect the turbocharger?

- A. Decreased turbocharger revolutions.
- B. Surging of the turbocharger.
- C. Increased turbocharger revolutions
- D. Higher air and gas temperature after turbocharger.

Answer-B

(Because if after ignition is occurring there will be more pr when the piston uncovers the ports hence more back pr where as the exhaust gases are not turning the turbine (low exhaust) hence surging)

19. What is the meaning of the term "valve clearance"?

- A. The clearance between the rocker arm and valve pushrod.
- B. The clearance between valve spindle disc and seat.
- C. The clearance between the rocker arm and camshaft pushrod.
- D. The clearance between the rocker arm and valve pushrod in either warm or cold state.

Answer-A

20. Which of the following types of crankshafts is much lighter at similar power requirements?

- A. Fully built type
- B. Semi built, all welded type
- C. Semi built type
- D. Solid forged type

Answer-B

21. If water contamination occurs in the crankcase oil of an auxiliary engine the oil viscosity will:

- A. Increase.
- B. Nothing happens
- C. Stay at the same.
- D. Decrease.

Answer-A (Because Emulsification Increase the viscosity)

21. Proper lubrication of the main bearings is more easily obtained in a single acting four-stroke/cycle diesel engine than a single acting two-stroke/cycle diesel engine because

- A. bearing pressure in a four-stroke/cycle single acting diesel engine is continually reversed
- B. bearing pressure in a two-stroke/cycle single acting diesel engine is continually reversed
- C. the maximum bearing pressure is higher in a single acting two-stroke/cycle diesel engine
- D. two-stroke/cycle diesel engines require more complicated lubrication piping

Answer-A

22. A unit type fuel injector is used on a diesel engine to

- A. meter the fuel
- B. produce the proper fuel oil pressure
- C. atomize the fuel
- D. all of the above

Answer-D

23. The air spring pressure to prevent ME exhaust valve hammer is in the region of_____

- A. 2 kg
- B. 7kg
- C. 12 kg
- D. 14 kg

Answer-B

24. When the prime movers of two paralleled generators, equipped with mechanical-hydraulic governors, are operating within their designed range, the unit with the least amount of speed drop will _____

- A. pick up more of any increase in load
- B. pick up less of any increase in load
- C. share an equal amount of any increase in load
- D. drop an equal amount of any decrease in load

Answer-A

25. In case of failure of control air supply, some valves continue locked in the position they were at the time of failure. They are said to be_____

- A. Fail-safe
- B. Fail –proof
- C. Fail-set
- D. Fail -blocked

Answer-C

26. Too high Calculated Carbon Aromaticity index (CCAI) of fuel oil indicates:

- A. Reduced ignition delay
- B. Increased ignition delay
- C. Reduced chances of knocking
- D. None

Answer-B

27. A high pressure differential in a main engine fuel oil filter onboard can be best reduced by

- A. Back flushing the filter manually
- B. Stopping the main engine to change the filter element
- C. Changing over to stand by filter if provided
- D. None of the above

Answer-A (Because by changing on to the other filter u r not reducing the differential pr in that filter element)

28. The theoretical minimum compression ratio necessary to ensure compression ignition in a direct injection diesel engine is _____

- A. 10:01
- B. 12:01
- C. 08:01
- D. all of the above

Answer-B

29. We have a problem with vibration in the turbocharger. What might be the cause?

- A. Dirty air inlet filter.
- B. The turbine rotor is not balanced
- C. The lubricating oil needs to be changed.
- D. Worn out turbocharger bearings.

Answer-B and D (B Because if any other turbine blade has been worn out or something turbine will not be balanced. D Because naturally if the roller or ball bearing has been worn it in either turbine or compress side respectively vibrations would be produced)

30. Generator over speed trip what will u check

- A. governor is not responding (ANS)
- B. fuel system
- C. moving parts (crank shaft)
- D. all of the above

Answer-A

31. With full load on the main engine, the turbocharger tachometer reads: Too low RPM. Why?

- A Damaged connection between pick- up and tachometer unit
- B Pick up is not connected to turbocharger.
- C Turbocharger need to be cleaned/ overhauled.
- D Pick up for tachometer is wrongly adjusted.

Answer-D

32. To reduce the weight of the reciprocating parts pistons of high speed engines are made considerably shorter. This results in _____

- A. less piston slap and quitter running
- B. increased crankshaft bearing wear
- C. slightly greater piston wear
- D. decreased side pressure

Answer-D

33. The effect of excessive tappet clearance in 4 stroke auxiliary engine _____

- A. Increased engine efficiency as expansion can take place for a longer duration and less energy wasted with the exhaust gases
- B. Valve hammering, change in timing of exhaust with more side thrust causing greater wear between stem and bush
- C. Loss in compression, poor combustion, improper mixing of fuel & air and gas gas leakage due to improper closing of valve
- D. Turbocharger surging, loss of rotation of valve spindle and high exhaust temperatures

Answer-B

34. Sequential starting of machineries after black out in engine room is necessary

- A. To prevent overload of Generators
- B. To quickly restore the failed power supply in order
- C. To prevent damage to machinery this has been switched off
- D. All of the above

Answer-A (because sequential starting is to prevent generator from overloading it has nothing to do with damage with machinery. it just starts the machinery in sequence which are needed first... preference... else because if all r started once all the load will come on generator and it will get trip... as starting current is high for motors)

35. Kinetic energy is converted into pressure energy in a turbocharger compressor by:

- A. Combined diffuser and nozzle ring
- B. Nozzle ring only
- C. Combined diffuser and volute casing
- D. Volute casing only

Answer-C

36. The over speeding of the diesel engine driving an electric generator could cause

- A. low voltage trip to trip
- B. reverse power trip to trip
- C. damage to windings
- D. excessive exhaust temperatures

Answer-C

37. Why is it essential to renew turbocharger bearings after a preset number of hours of running even if the bearings are in seemingly perfect condition?

- A. Because they are prone to failure due to prolonged exposure to high temperature conditions.
- B. Because they are subject to cyclic loading and are prone to failure due to metal fatigue.
- C. It is not essential to renew if condition monitoring suggests perfect condition.
- D. Lube oil contamination is bound to occur and affect the condition of the bearings.

Answer-B

38. What long term effect will excessively high temperature have on lubricating oil quality?

- A. Cause oxidation which reduces viscosity.
- B. Evaporates the oil giving high consumption.
- C. The oil flashpoint will be changed.
- D. Cause oxidation which increase viscosity.

Answer-D

39. You have checked the oil viscosity in an auxiliary engine with the viscosity test kit. The result shows that the viscosity is high. What will you do?

- A. Decrease the cooling water temperature for the oil.
- B. Clean the system and change the oil
- C. Increase the cooling water temperature for the oil.
- D. Increase the lub oil pressure.

Answer-B

40. Valves used in diesel engine fuel oil pressure piping are to be

- A. installed to close against flow
- B. solenoid released upon the failure of engine lubrication
- C. either of the gate or globe valve type
- D. forge constructed under the approval of the Marine Inspector

Answer-A

41. A normal manometer reading of turbocharger air suction filter and normal speed of the turbocharger but reduced scavenge air pressure may be due to:

- A. Fouling of the nozzle ring
- B. Fouling of diffuser or compressor wheel
- C. Fouling of the turbine
- D. Cold climate

Answer-B

42. Following method is sometimes used in constant pressure turbochargers of a 4-stroke diesel alternators during starting and rapid acceleration:

- A. Auxiliary electrical blowers assisting turbochargers during starting
- B. Auxiliary shaft driven blowers assisting turbochargers during starting
- C. Auxiliary air drive for turbocharger acceleration during starting
- D. Variable geometry turbocharging

Answer-C

43. The difference between rotocap and spinners for rotating exhaust valve spindle is that:

- A. Rotocaps rotate the valves while closing, while spinners rotate them while opening
- B. Rotocaps rotate the valves while opening, while spinners rotate them while closing
- C. Rotocaps rotate the valves while opening, while spinners rotate the valve for the entire duration until valve is seated

Answer-C

44. The difference between water washing and dry cleaning the TC turbine is

- A. there is no difference one is wet, the other is dry
- B. wet washing requires reduced load
- C. dry cleaning requires reduced load
- d) none of the above

Answer-B

45. Some 4-stroke engines are fitted with a rotorcap on the cylinder head valves. For what reason?

- A. Rotate the inlet valve during operation.
- B. Distribute the exhaust gas or the air inlet better to improve combustion.
- C. Improve the scaling surface function, increase the service time of the exhaust valve in the engine
- D. To prevent the valve spindle from sticking

Answer-C

46. During prolonged astern maneuvering of the relative expansion between any of the turbine its casing is likely to increase for an alarming level you should (multi choice) in photo no3 in download

- A) Inform the bridge that no further maneuvering is possible as the turbine are likely to be damaged
- B) Reduce the vacuum further to control the relative expansion
- C) Keep maneuvering irrespective of damage to the turbines
- D) Request the bridge to try to reduce number of astern movements

Answer-D

47. The purpose of an air cooler in a supercharging system is to:

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- C. Cool supercharged air to increase its density such that the dew point is not reached to avoid entry of moisture into the engine
- D. Cool supercharged air to increase its density and also to keep the peak temperature and exhaust gas temperature within limits

Answer-C

48. What prevents rotation and fretting between a thin shell bearing and its housing?

- A. Location tangs or pegs
- B. The nip or crush of the bearing
- C. A special kind of adhesive
- D. Any of the above

Answer-B

49. Clearance volume scavenging in a turbocharged, four-stroke/cycle diesel engine is accomplished

- A. During the valve overlap period
- B. With only the exhaust valve open
- C. At a pressure below atmospheric
- D. Without cooling the cylinders or pistons

Answer-A

50. The type of corrosion normally occurring in cooling Fresh Water systems of Marine Diesel Engines is

- A. Stress corrosion
- B. Hot corrosion
- C. Bimetallic corrosion
- D. Selective Phase corrosion

Answer-D