U.S.C.G. Merchant Marine Exam

QMED

Q804 Oiler – Part I

(Sample Examination)

Choose the best answer to the following Multiple-Choice Questions:

1. In order for microbiological growths to thrive in a fuel tank it is necessary for _____.

   A. vanadium to be present
   B. low temperatures to exist
   C. moisture or water to be present
   D. electrolysis to be occurring

   Correct answer: C

2. Inhalation of high concentrations of chlorofluorocarbon refrigerants (CFCs) may have which of the following effects?

   A. drowsiness
   B. loss of concentration
   C. cardiac arrhythmias
   D. all of the above

   Correct answer: D

3. How is accidental flooding of the engine room bilges through the bilge system prevented?

   A. by installing eductors in all bilge rose boxes
   B. by stop-check valves installed in the bilge suction manifolds
   C. by installing a swing check before each bilge valve
   D. by using a positive displacement reciprocating bilge pump

   Correct answer: B

4. Which of the precautions listed should be taken before opening any part of a refrigeration system for the purpose of accomplishing non-major repairs?

   A. Set the high-pressure cut-out on manual to prevent automatic starting.
   B. Bring the part of the system to be opened to 0 psig.
   C. Use the hot gas defrost line to remove any frost on the evaporator coils.
   D. Bring the part of the system to be opened to a pressure corresponding to the ambient temperature.

   Correct answer: B

5. The leakage of air into the pump casing by way of the packing gland of a condensate pump, is prevented by _____.

   A. special packing in the stuffing box
   B. the vacuum in the pump suction
   C. an air seal line from the compressed air line
   D. a water seal line to the packing gland

   Correct answer: D

6. Injection pressure in a common rail fuel system is controlled by _____.

   A. engine speed
   B. varying the fuel pump piston stroke
   C. varying the injector needle valve clearance
   D. a bypass valve

   Correct answer: D

7. The purpose of the main diesel engine reduction gears is to _____.

   A. transmit vibration and thrust to the ship's hull
   B. reduce high diesel engine RPM to an efficient propeller RPM
   C. provide a means of reversing the main diesel engines in an emergency
   D. reduce engine room noise levels during high-speed operations

   Correct answer: B

8. In addition to achieving a speed reduction for efficient propeller operation, what statement represents other possible functional purposes for reduction gears?

   A. Reduction gears can be used for propeller thrust reversal and reduction gears can be used for multiple prime mover inputs.
   B. Reduction gears can be used for propeller thrust reversal and reduction gears can be used for multiple propeller shaft outputs.
   C. Reduction gears can be used for engine rotation reversal and reduction gears can be used for multiple propeller shaft outputs.
   D. Reduction gears can be used for engine rotation reversal and reduction gears can be used for multiple prime mover inputs.

   Correct answer: A

9. What statement is true concerning the illustrated boiler saddle, support and/or foot? Illustration SG-0015

   A. The illustrated saddle supports the steam drum and is bolted to rubber shock mounts, which sit on top of feet which are fixed to the hull.
   B. The illustrated saddle supports the water drum and is fixed firmly to the support base by bolts through the saddle's flange. The support base sits on top of feet welded to the hull of the ship.
   C. The illustrated saddle supports the boiler fire brick and prevents it from breaking by absorbing any shock.
   D. The illustrated foot is the sliding foot located underneath the front or rear of the water drum, depending on the type of boiler, and allows for expansion or contraction of the water drum.

   Correct answer: D

10. In terms of the diluting effect of excessive excess air, when viewing the flame through a peephole, what would be the indication of the greatest diluting effect with far too much excess air?

    A. Yellow flame
    B. Orange flame
    C. Dazzling white flame
    D. Golden yellow flame

    Correct answer: C

11. On a slow speed, crosshead type, diesel engine, in which application is the lubricating oil considered a consumable?

    A. Cylinder lubricating oil
    B. Piston cooling oil
    C. Main circulating oil
    D. Turbocharger lubricating oil

    Correct answer: A

12. Zincs are installed in the main and auxiliary condenser waterboxes to _____.

    A. prevent air pockets
    B. reduce turbulence
    C. prevent scaling
    D. reduce the effects of electrolysis

    Correct answer: D

13. The purpose of the main reduction gears is to _____.

    A. reduce engine room noise levels during high-speed operations
    B. provide a means of reversing the main engines in an emergency
    C. reduce high turbine RPM to an efficient propeller RPM
    D. transmit vibration and thrust to the ship's hull

    Correct answer: C

14. Which of the following statements about boilers is correct?

    A. Loss of water will not harm a boiler if the water level can be restored.
    B. The water level in a properly operated boiler will not shrink or swell.
    C. A hot boiler will continue to generate steam after the fires are secured.
    D. No boiler will continue to generate steam after the fires are secured.

    Correct answer: C

15. As shown in the illustration, what component would normally be installed at location "I"? Illustration MO-0231

    A. Boiler sootblower unit
    B. Oil fired mechanical burner
    C. Flue gas smoke indicator
    D. Boiler water level indicator

    Correct answer: B

16. Why are two fuel oil heaters "E" provided in the fuel oil system shown in the illustration? Illustration SG-0009

    A. To provide a backup in case one of the heaters becomes inoperable.
    B. Two heaters are necessary when both boilers steam at full load.
    C. Each heater supplies fuel to a different boiler.
    D. To allow fuel of different temperatures to be provided to each boiler.

    Correct answer: A

17. When an air started, four-stroke cycle diesel engine is being cranked over, the starting air is admitted to each cylinder during the beginning of its _____.

    A. intake stroke
    B. compression stroke
    C. power stroke
    D. exhaust stroke

    Correct answer: C

18. Fuel oil day tanks for diesel engines must be checked and cleaned at regular intervals in order to remove _____.

    A. water
    B. micro-organism growth
    C. sludge
    D. all of the above

    Correct answer: D

19. In the system illustrated, what type of valves are downstream of point "A"? Illustration SG-0005

    A. globe valves/ gate valves
    B. swing check/ stop valves
    C. stop-check/ stop valves
    D. gauge valves/ drain valves

    Correct answer: C

20. The condensers located in the various stages of a flash evaporator are cooled by _____.

    A. brine
    B. sea water
    C. air
    D. distillate

    Correct answer: B

21. As shown in the illustrated D type single furnace boiler, what does item "E" represent? Illustration SG-0008

    A. Downcomer tubes
    B. Upcomer tubes
    C. Riser tubes
    D. Support tubes

    Correct answer: A

22. The atmospheric drain tank (ADT) normally drains to the _____.

    A. distillate tank
    B. reserve feed tanks
    C. main and/or auxiliary air ejector condenser
    D. main and/or auxiliary condenser

    Correct answer: D

23. If you hear a continuous blast of the whistle for not less than 10 seconds supplemented by the continuous ringing of the general alarm bells for not less than 10 seconds, what does this indicate?

    A. Man overboard
    B. Fire and emergency
    C. Dismissal from a boat drill
    D. Abandon ship

    Correct answer: B

24. According to the illustrated diesel engine cooling water systems diagram, what fluid is the low temperature central freshwater thermostat designed to maintain? Illustration MO-0129

    A. The low temperature central fresh water return header temperature
    B. The low temperature central fresh water supply header temperature
    C. The low temperature central freshwater cooler outlet temperature
    D. The low temperature central freshwater cooler inlet temperature

    Correct answer: B

25. A bearing using an oiling ring as a means of static oil feed must occasionally be serviced by removing the wear particles, grit, and moisture. How is this accomplished?

    A. Draining the bottom of the bearing lube oil sump
    B. Changing the filter element
    C. Rotating the handle of the lube oil strainer
    D. Draining the bottom of the strainer housing

    Correct answer: A

26. If an air compressor is used to supply air primarily to the combustion control system and other pneumatic controllers, the entire system is known as the _____.

    A. ships service air system
    B. supply air system
    C. control air system
    D. forced draft air system

    Correct answer: C

27. High-pressure steam drains are normally discharged to the _____.

    A. DC heater
    B. reserve feed tank
    C. drain and inspection tank
    D. atmospheric drain line

    Correct answer: A

28. Prior to initial light off of an idle boiler, what must first be done to prevent boiler flareback?

    A. The furnace must first be purged of combustible vapors with the forced draft blower while the air register doors are open.
    B. The furnace must first be purged of inert vapors and oxygen with the forced draft blower while the air register doors are open.
    C. The furnace must first be purged of inert vapors and oxygen with the forced draft blower while the air register doors are closed.
    D. The furnace must first be purged of combustible vapors with the forced draft blower while the air register doors are closed.

    Correct answer: A

29. Unless the system is designed for such operation, two compressors should not be operated in parallel in a refrigeration system for what reason?

    A. the evaporators would fail due to excessively low suction pressure
    B. lubricating oil may be transferred from one compressor to the other
    C. condenser pressure will be too high causing condenser failure
    D. operation of two compressors will overload the expansion valves

    Correct answer: B

30. Air motors used for starting some auxiliary diesel engines are generally the type known as _____.

    A. plunger motors
    B. vane motors
    C. gear motors
    D. accumulator motors

    Correct answer: B

31. The device shown in the illustration is a/an _____. Illustration GS-0116

    A. vane type steering gear
    B. diesel engine motor mount
    C. mechanical shaft seal
    D. oil scraper ring stuffing box for a crosshead engine

    Correct answer: A

32. In which of the following types of evaporators is the control of brine density least important?

    A. Flash evaporators
    B. Basket evaporators
    C. Submerged tube evaporators
    D. Solo shell evaporators

    Correct answer: A

33. In an auxiliary diesel engine "bypass type" lubricating oil system, the main lube oil pump forces _____.

    A. some of the oil used by the engine through a filter
    B. all of the oil used by the engine through a centrifuge
    C. all of the oil used by the engine through a filter
    D. some of the oil used by the engine through a centrifuge

    Correct answer: A

34. Which of the listed substances can be satisfactorily removed from diesel fuel by centrifuging?

    A. Sludge
    B. Gasoline
    C. Fuel oil
    D. Lube oil

    Correct answer: A

35. What is a quick and effective way of determining whether or not a boiler water gauge glass is operating properly?

    A. Quickly opening and then reclosing the gauge glass upper root valve.
    B. Watching for the level to fluctuate in the glass corresponding to ship movements such as pitching.
    C. Quickly opening and then reclosing the gauge glass drain valve.
    D. Quickly opening and then reclosing the gauge glass lower root valve.

    Correct answer: C

36. What is the function of the aftercoolers installed in the diesel engine air intake system?

    A. Decrease the air density
    B. Increase the exhaust temperature
    C. Decrease the lube oil temperature
    D. Increase the air density

    Correct answer: D

37. While fires are lit in a boiler, in terms of uptake dampers and air register doors, what conditions must be met?

    A. All uptake dampers should be locked open, all air register doors on lit burners should be throttled according to the firing rate, and all air register doors on idle burners should be open.
    B. All uptake dampers should be locked open, all air register doors on lit burners should be wide open or throttled, and all air register doors on idle burners should be closed.
    C. All uptake dampers should be throttled according to the firing rate, all air register doors on lit burners should be throttled according to the firing rate, and all air register doors on idle burners should be closed.
    D. All uptake dampers should be throttled according to the firing rate, all air register doors on lit burners should be wide open, and all air register doors on idle burners should be closed.

    Correct answer: B

38. Greases used for most marine applications would have what National Lubricating Grease Institute (NLGI) grade?

    A. 00
    B. 2
    C. 4
    D. 6

    Correct answer: B

39. The cooling water flow from an air ejector intercondenser and aftercondenser is discharged directly into the _____.

    A. auxiliary condenser hotwell
    B. main condenser hotwell
    C. condensate and feed system
    D. atmospheric drain tank

    Correct answer: C

40. The cubic inch (or liter) displacement of a cylinder is determined by the diameter of the piston and the _____.

    A. length of the crankshaft
    B. volume of the clearance space
    C. weight of the piston
    D. length of the stroke

    Correct answer: D

41. Reduction gear casings are vented in order to _____.

    A. allow windage to exist for cooling the gears
    B. avoid a buildup of pressure within the gear case
    C. minimize lube oil foaming within the case
    D. allow for axial clearance between the gears

    Correct answer: B

42. Concerning the classification of steam turbines, a cross compound designed unit _____.

    A. is made up of a varied assortment of impulse and reaction staging
    B. consists of reaction stages and a dummy piston
    C. consists of one Curtis stage and reaction blading
    D. consists of a high-pressure turbine, crossover pipe, and low-pressure turbine

    Correct answer: D

43. The term "oil foaming" in refrigeration practice, is used to describe what event?

    A. release of miscible refrigerant from the lubricant in the crankcase
    B. sudden evaporation of entrapped moisture from the crankcase lubricant
    C. sudden evaporation of entrapped air from the refrigerant liquid
    D. release of dissolved lubricant from the refrigerant in the crankcase

    Correct answer: A

44. An exhaust gas bypass is installed on a waste heat boiler in order to _____.

    A. bypass exhaust gas at high loads to prevent excessive back pressure
    B. bypass a portion of the exhaust gas at peak loads for better efficiency
    C. recycle exhaust gas to the turbocharger
    D. minimize moisture condensation in the boiler gas passages at low loads

    Correct answer: D

45. Connecting rods in a diesel engine are used to connect the _____.

    A. engine to the bed
    B. piston to the crankshaft
    C. rocker arm to the camshaft
    D. crankshaft to the gear train

    Correct answer: B

46. In a diesel engine jacket water cooler, with sea water cooling the fresh water, the _____.

    A. jacket water pressure must always be less than the sea water pressure
    B. jacket water pressure should always be greater than the sea water pressure
    C. jacket water temperature must always be less than 60°F
    D. sea water temperature must never be warmer than 40°F

    Correct answer: B

47. How is lube oil pressure provided to a turbogenerator when starting the unit in an automated plant?

    A. a line from the gravity tank
    B. a line from the other generator
    C. the hand-operated or auxiliary lube oil pump
    D. the main lube oil pump

    Correct answer: C

48. One function of the air receiver in a compressed air system is to _____.

    A. remove all traces of oil from the air
    B. receive exhaust air from pneumatic accessories
    C. minimize the system's line pulsations
    D. dry the air discharged from the intercooler

    Correct answer: C

49. As shown in the illustration, what is the diaphragm orifice labeled "H" used for? Illustration GS-0155

    A. pressure reducer
    B. injector
    C. time delay
    D. check valve

    Correct answer: C

50. Under normal conditions, the rate of heat transfer in a feedwater heater is most greatly affected by the _____.

    A. speed of the main feed pump
    B. temperature differential between the steam and feedwater
    C. pH of the feedwater
    D. density of the feedwater

    Correct answer: B

51. A three-way thermostatic control valve regulates the diesel engine cooling water temperature by passing a portion of the water _____.

    A. around the cooler
    B. overboard
    C. around the engine
    D. to the expansion tank

    Correct answer: A

52. In the diagram illustrated, the direction of flow through item 3 is _____. Illustration GS-0125

    A. in either direction
    B. dependent on the pump's suction pressure
    C. dependent on the pump's discharge pressure
    D. in one direction only

    Correct answer: D

53. Whether using a centrifuge or a simple filter, oil cleaning and filtration will be the most effective when the oil is at a _____.

    A. high temperature and a high viscosity
    B. high temperature and a low viscosity
    C. low temperature and a high viscosity
    D. low temperature and a low viscosity

    Correct answer: B

54. Auxiliary boilers are divided into several classifications, one of which is _____.

    A. water-tube supercritical circulation
    B. water-tube forced circulation
    C. fire-tube controlled circulation
    D. fire-tube express circulation

    Correct answer: B

55. Which system should be used when required to raise the water level in an idle boiler?

    A. Auxiliary condensate system
    B. Condensate recirc system
    C. Main feed system
    D. Main condensate system

    Correct answer: C

56. The load is always placed on the lower half of the main bearings in a _____.

    A. two-stroke cycle engine
    B. four-stroke cycle engine
    C. reverse cycle engine
    D. double acting engine

    Correct answer: A

57. While underway on a steamship, the main condenser is operating under a 28.09 "Hg vacuum gauge. According to the illustrated properties of saturated steam table, how much condensate depression would there be if the condensate temperature leaving the main condenser hot well is 96.0°F? Illustration SG-0026

    A. 1.83°F
    B. 2.24°F
    C. 8.71°F
    D. 70.15°F

    Correct answer: B

58. The process of supplying a diesel engine cylinder with air at a pressure greater than atmospheric is called _____.

    A. engine displacement
    B. super-aspirating
    C. air injection
    D. supercharging

    Correct answer: D

59. According to the temperature/enthalpy diagram for water at atmospheric pressure, if the substance is undergoing a heat gain, what heat transfer process is represented by the region associated with "4"? Illustration SG-0001

    A. Steam dissipating its latent heat of condensation and changing its physical state to become water.
    B. Water absorbing its latent heat of vaporization and changing its physical state to become steam.
    C. Steam dissipating its specific heat and experiencing a drop in temperature.
    D. Water absorbing its specific heat and experiencing a rise in temperature.

    Correct answer: B

60. The exhaust system for a turbocharged diesel engine functions to _____.

    A. power the aftercoolers
    B. power the turbocharger
    C. reduce the cylinder scavenge effect
    D. cool the turbocharger

    Correct answer: B

61. Which of the following substances is normally classified as a low-pressure refrigerant?

    A. R-12
    B. R-22
    C. R-123
    D. R-134A

    Correct answer: C

62. Which of the listed types of superchargers will NOT have a volumetric capacity proportional to engine speed?

    A. Exhaust gas turbocharger
    B. Roots blower
    C. Piston type blower
    D. Vane type blower

    Correct answer: A

63. For an emergency stop of the rotor of a main turbine while underway at sea you should _____.

    A. apply the prony brake
    B. secure all steam to the turbine
    C. tighten the stern tube packing gland
    D. admit astern steam to the turbine after securing the ahead steam

    Correct answer: D

64. What is the danger if a boiler is brought on the line with its steam pressure much higher than that of the boiler already on the line?

    A. priming and carryover
    B. low water
    C. an overloaded superheater
    D. thermal shock

    Correct answer: A

65. Heat exchangers are most commonly found in a small auxiliary diesel engine _____.

    A. governing system
    B. air starting system
    C. fuel oil system
    D. lube oil system

    Correct answer: D

66. What type of disinfection system has the disadvantage that it would fail to provide residual disinfectant in the potable water?

    A. A chlorinator located at the desalinator discharge piping to the potable water storage tank.
    B. An ultraviolet irradiator at the desalinator discharge to the potable water storage tank.
    C. A chlorinator located at the potable water storage tank recirculation line.
    D. A brominator located at the desalinator discharge piping to the potable water storage tank.

    Correct answer: B

67. Guardian valves are installed on main propulsion turbines to _____.

    A. provide an emergency means of quickly closing the throttle
    B. prevent steam from leaking into the astern element while the vessel is maneuvering
    C. provide a means to supply steam directly to the astern element of the turbine
    D. prevent steam from leaking into the astern element while at full sea speed

    Correct answer: D

68. If you hear the general alarm sounded 3 times supplemented by 3 short blasts of the whistle, what does this indicate?

    A. Dismissal from fire and emergency
    B. Fire and emergency
    C. Abandon ship
    D. Dismissal from a boat drill

    Correct answer: A

69. Which of the following methods is used to lubricate main propulsion turbine reduction gears?

    A. Oil is sprayed through nozzles at the point of gear mesh.
    B. Oil is pressure fed through internal drilled passages which force oil to the gear's periphery.
    C. The gears run through an open oil sump and oil is carried along on the gear teeth.
    D. Oil rings in channels outside the gears dip into oil in the sump and carry it to the gear teeth.

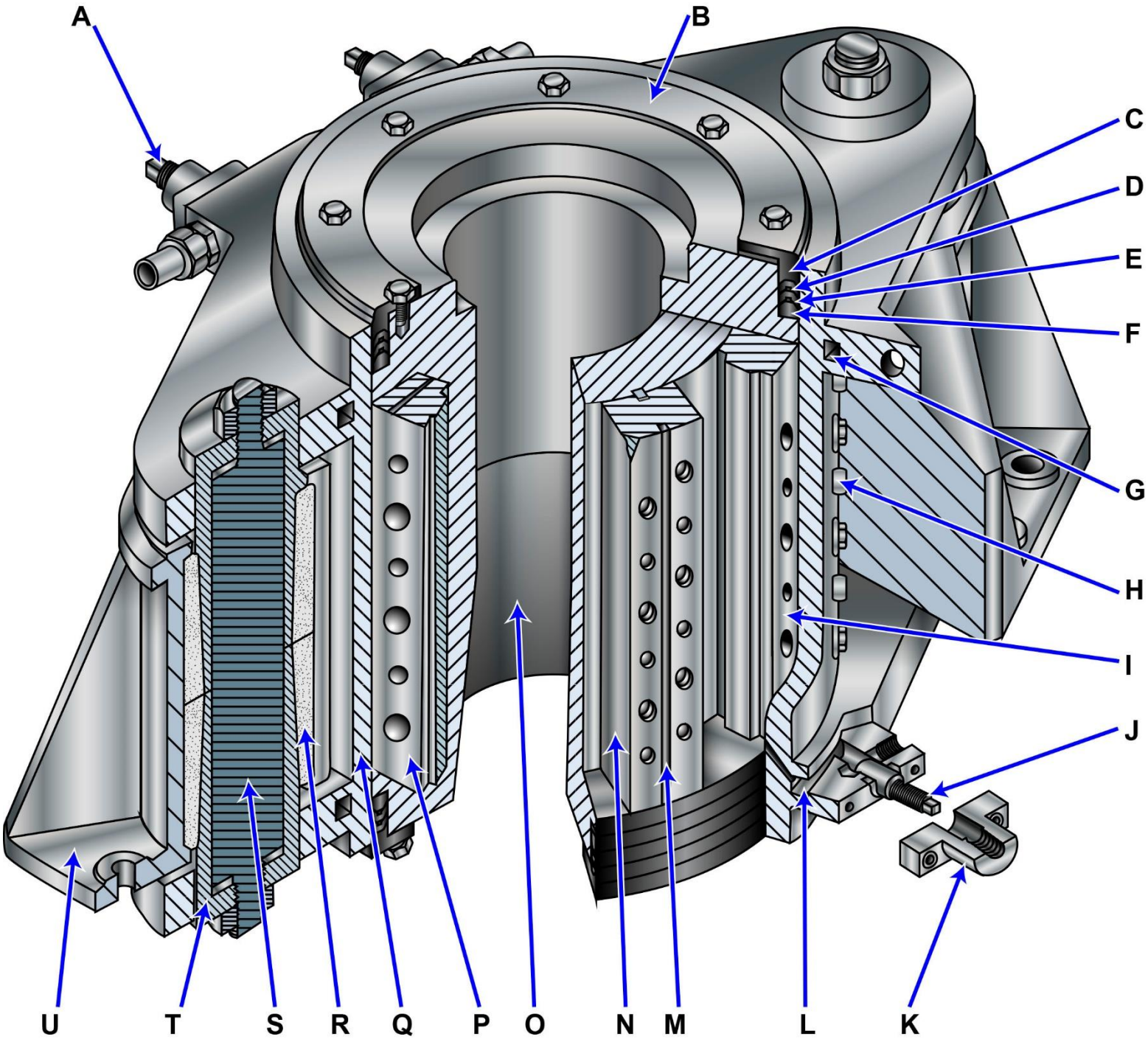
    Correct answer: A

70. A naturally aspirated diesel engine at full throttle will have an intake manifold pressure _____.

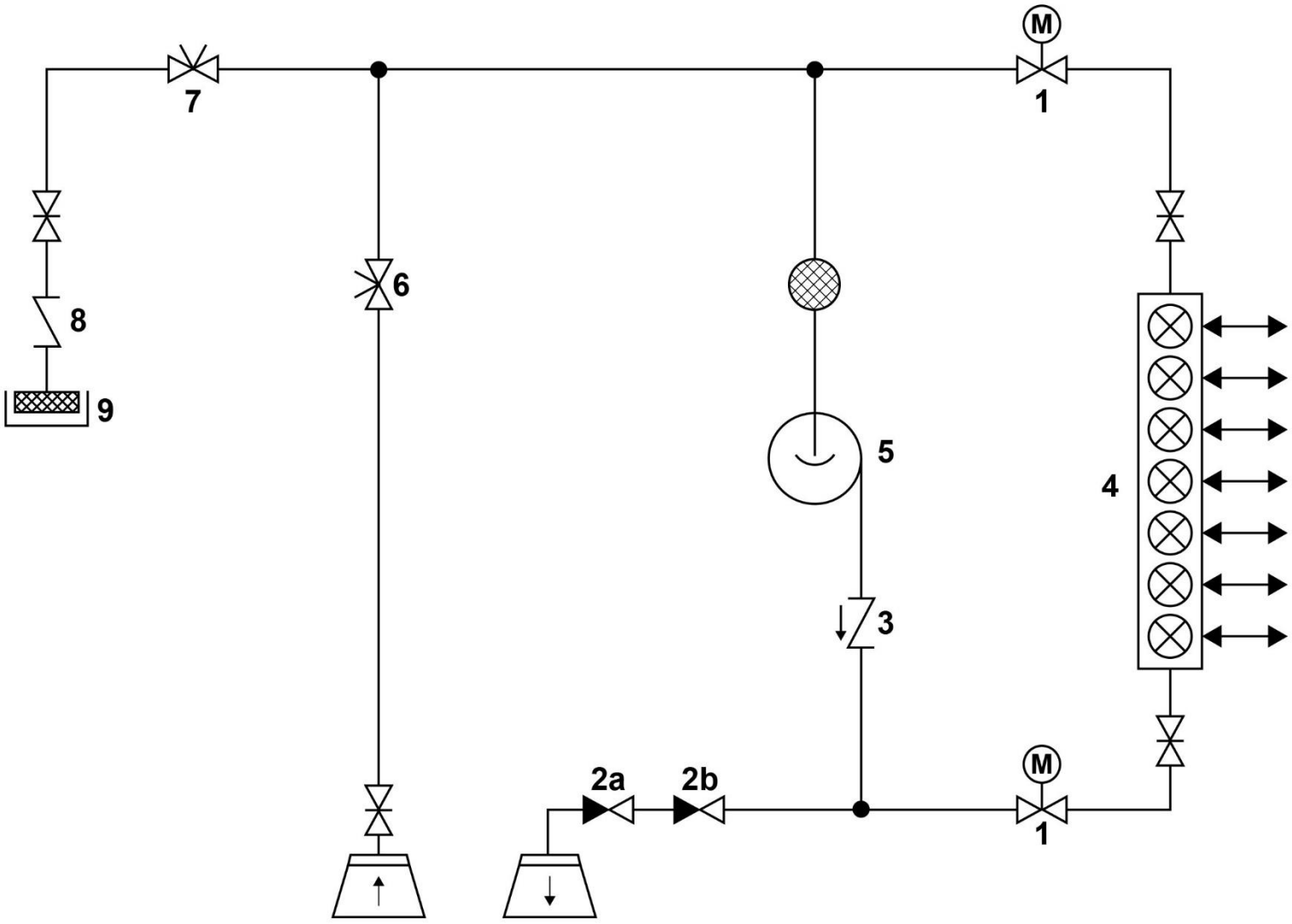
    A. slightly less than atmospheric pressure
    B. approximately equal to exhaust manifold pressure at all times
    C. that is widely fluctuating
    D. constantly decreasing as engine load increases

    Correct answer: A

GS-0116



GS-0125



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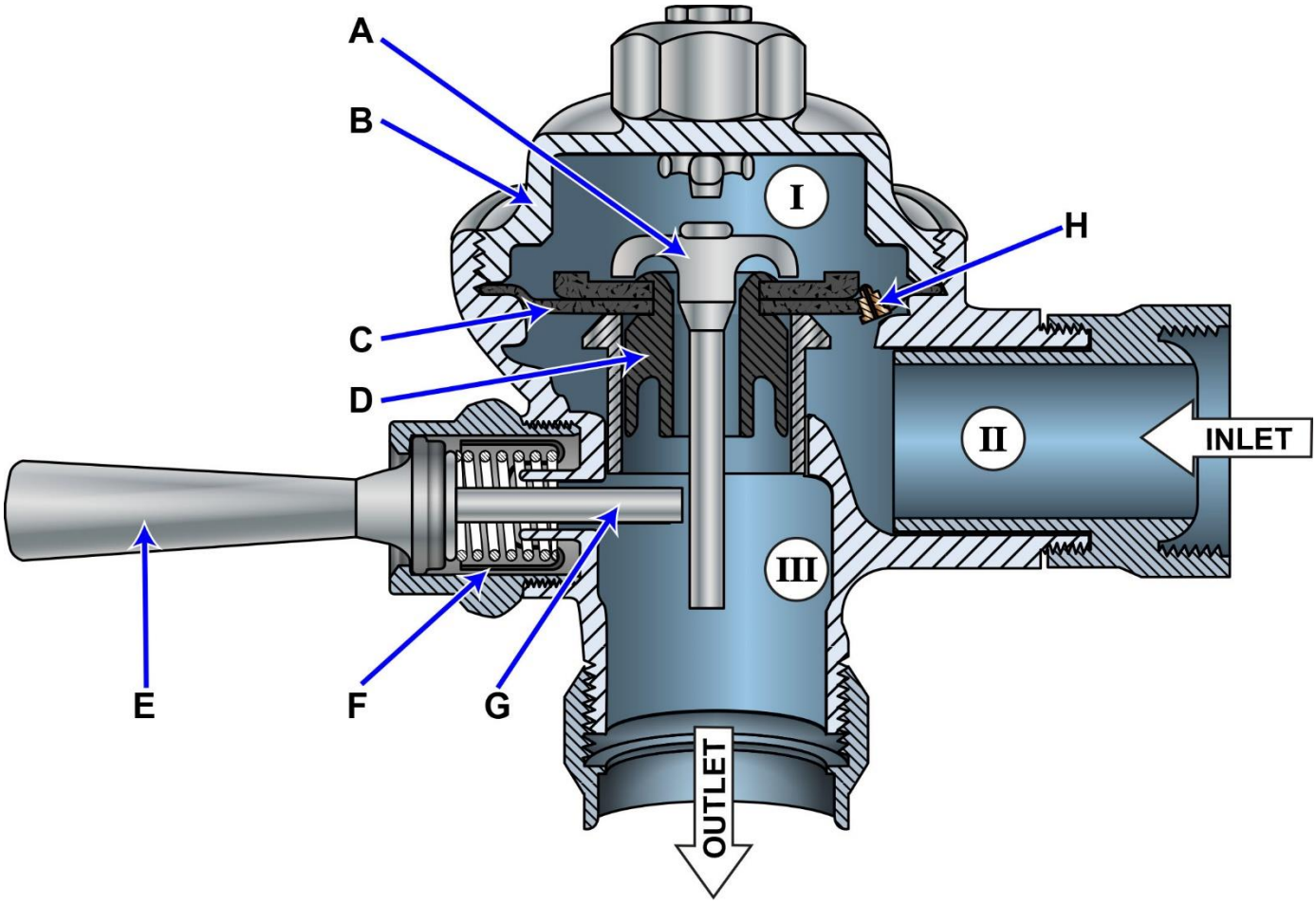

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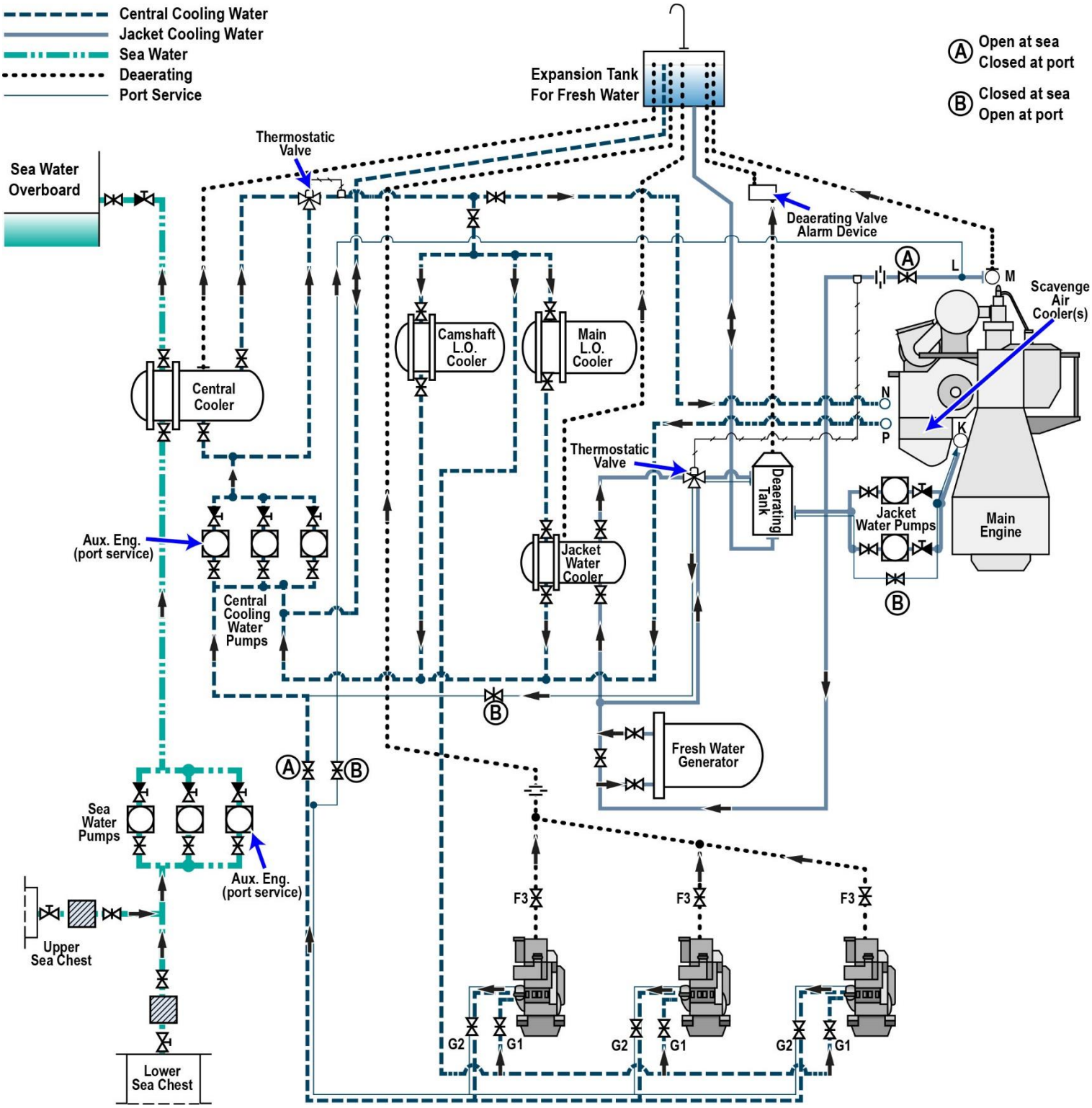

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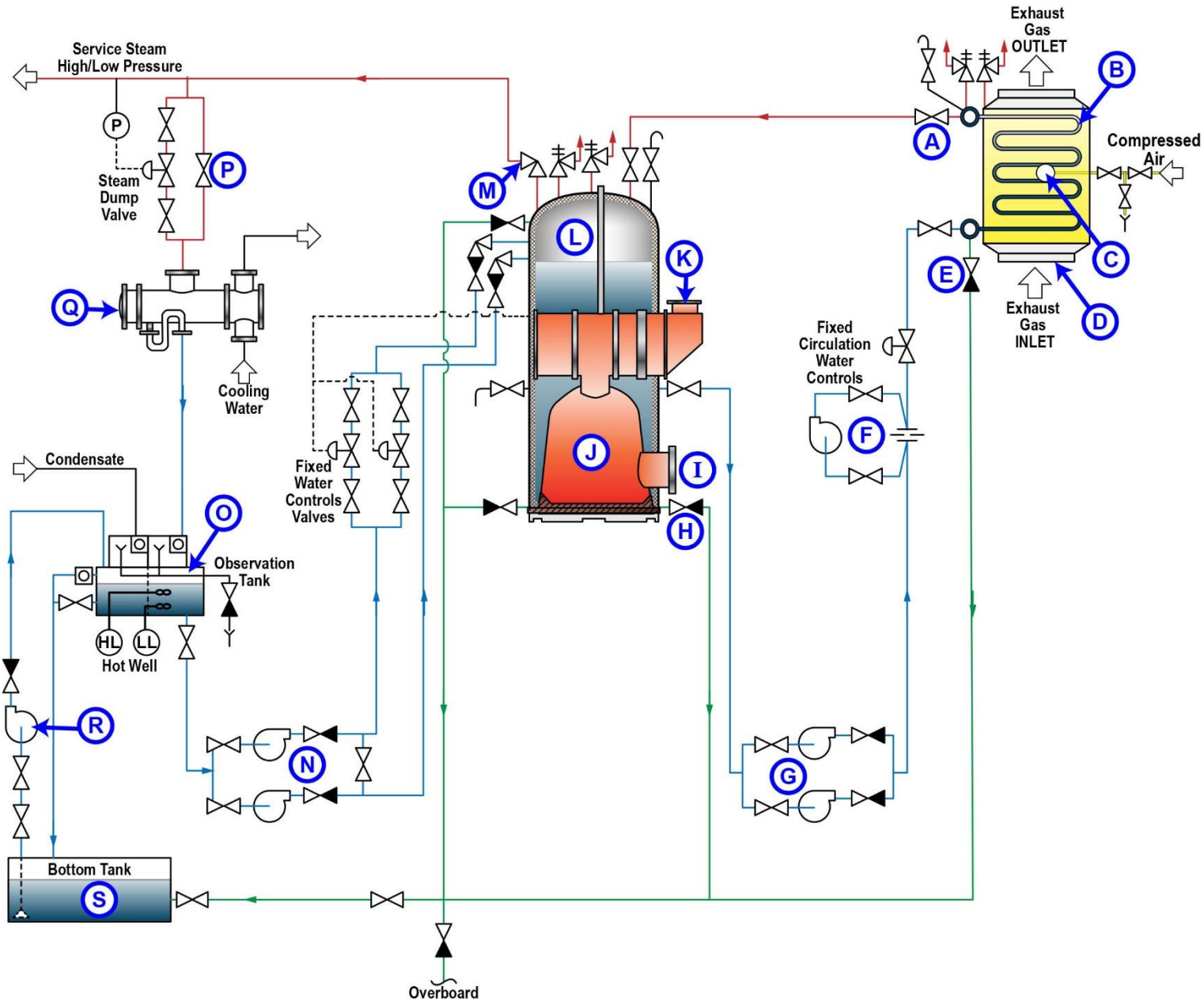

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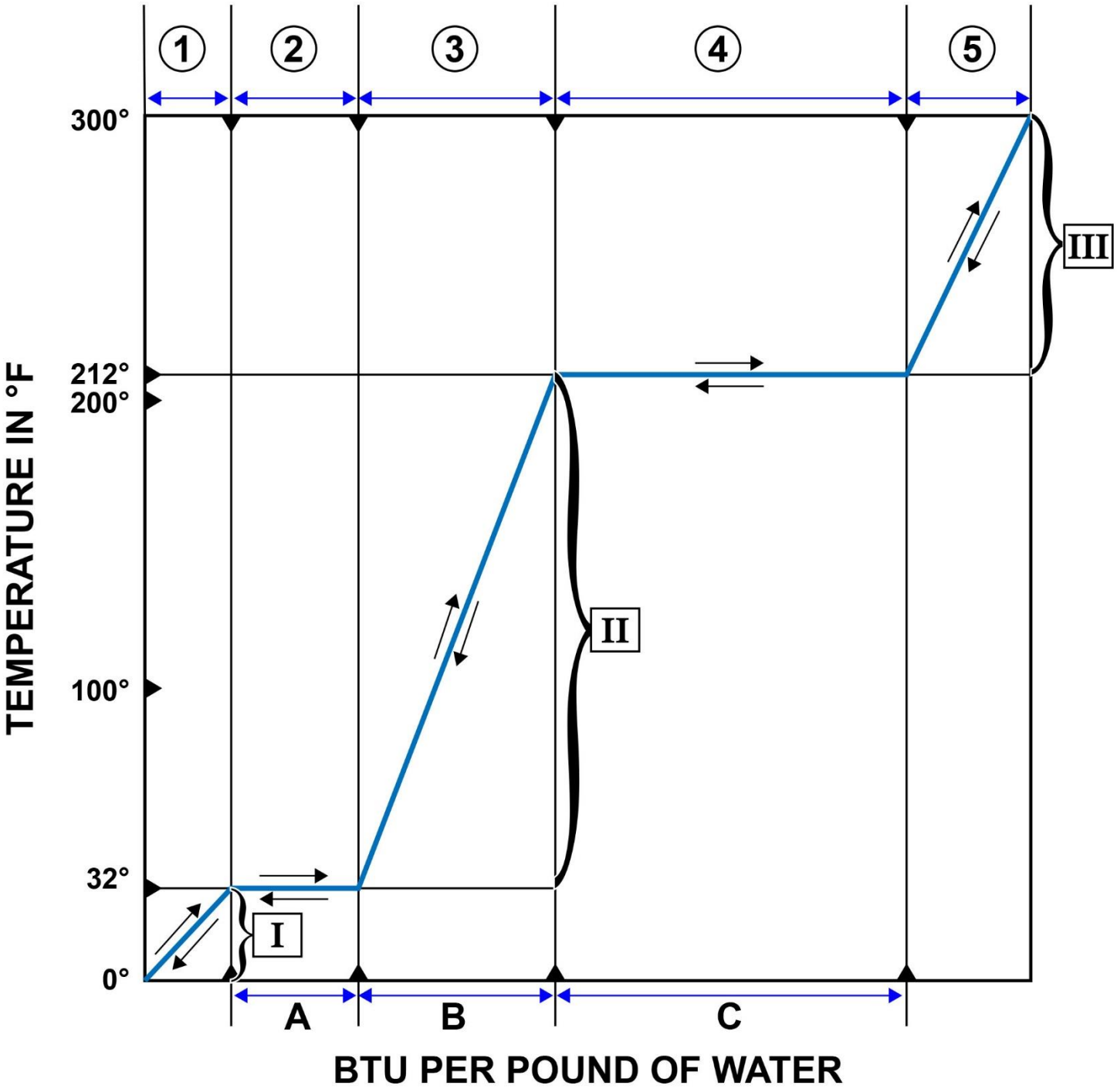

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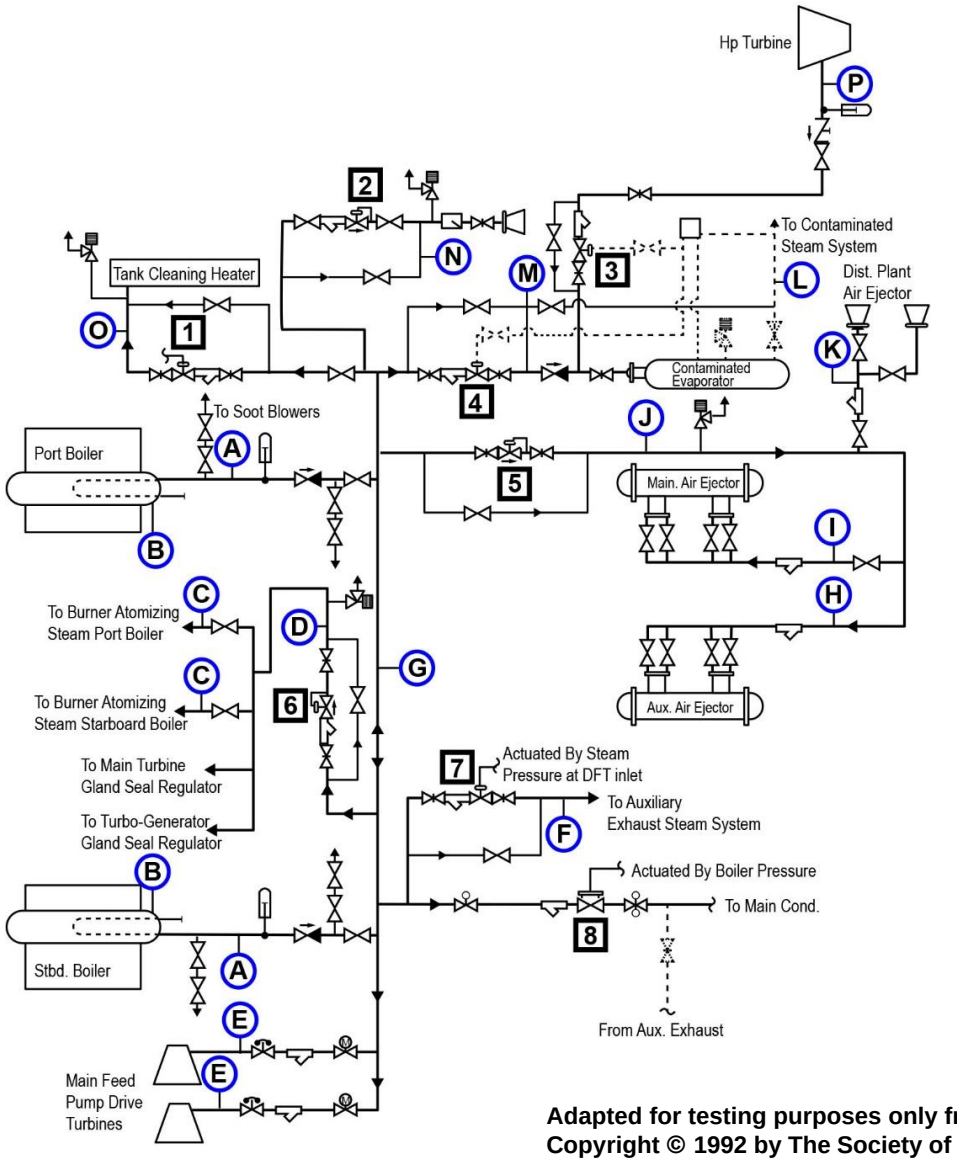
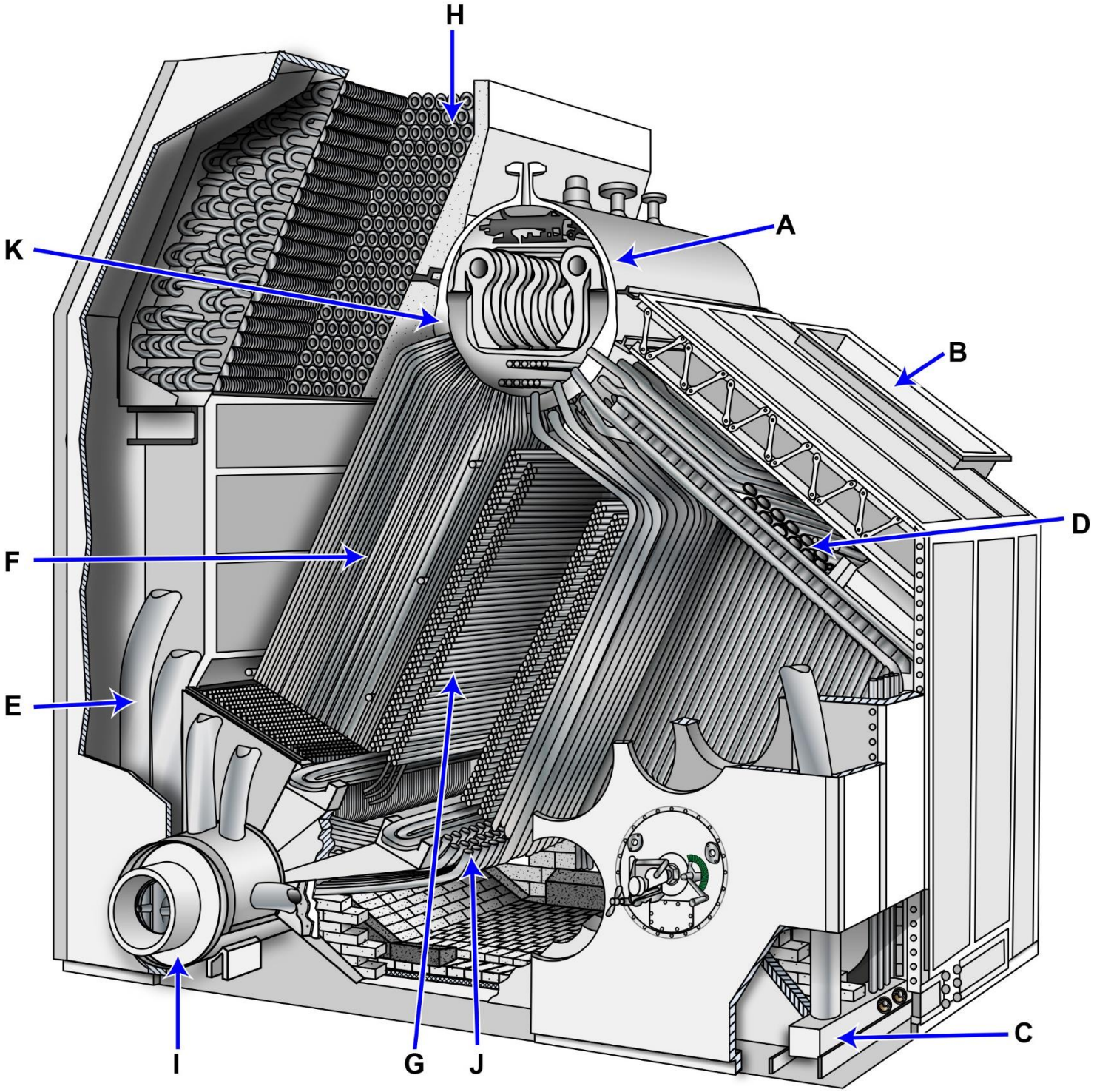
SG-0005



Nominal System Pressures	
Gauge	**psig**
A	850
B	860
C	143
D	143
E	850
F	32
G	850
H	143
I	143
J	143
K	143
L	130
M	350
N	140
O	130
P	205 (at full power)

Device Settings	
Valve	**Psig**
1	130
2	140
3	185
4	350
5	143
6	143
7	32
8	860

SG-0008



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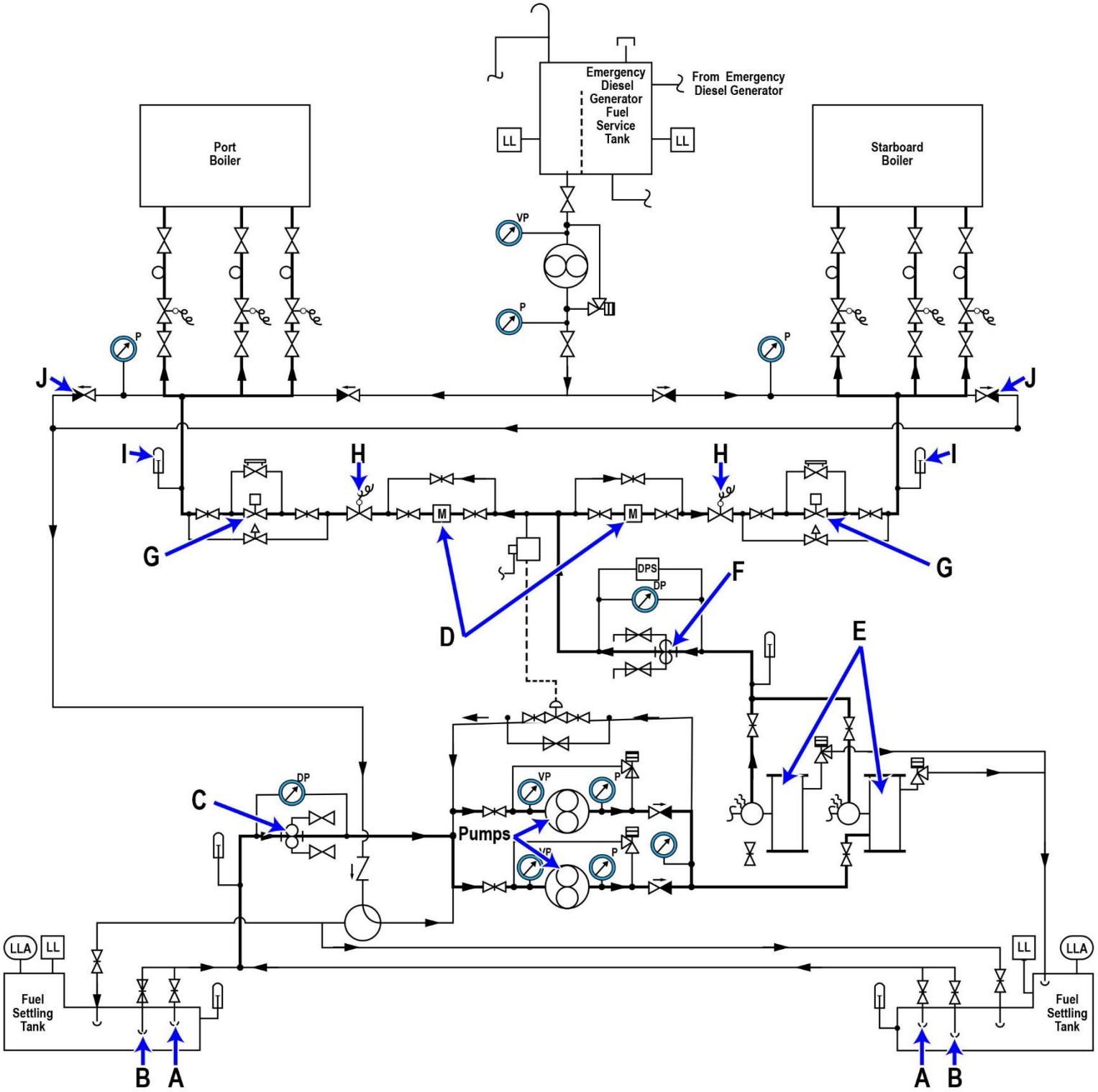

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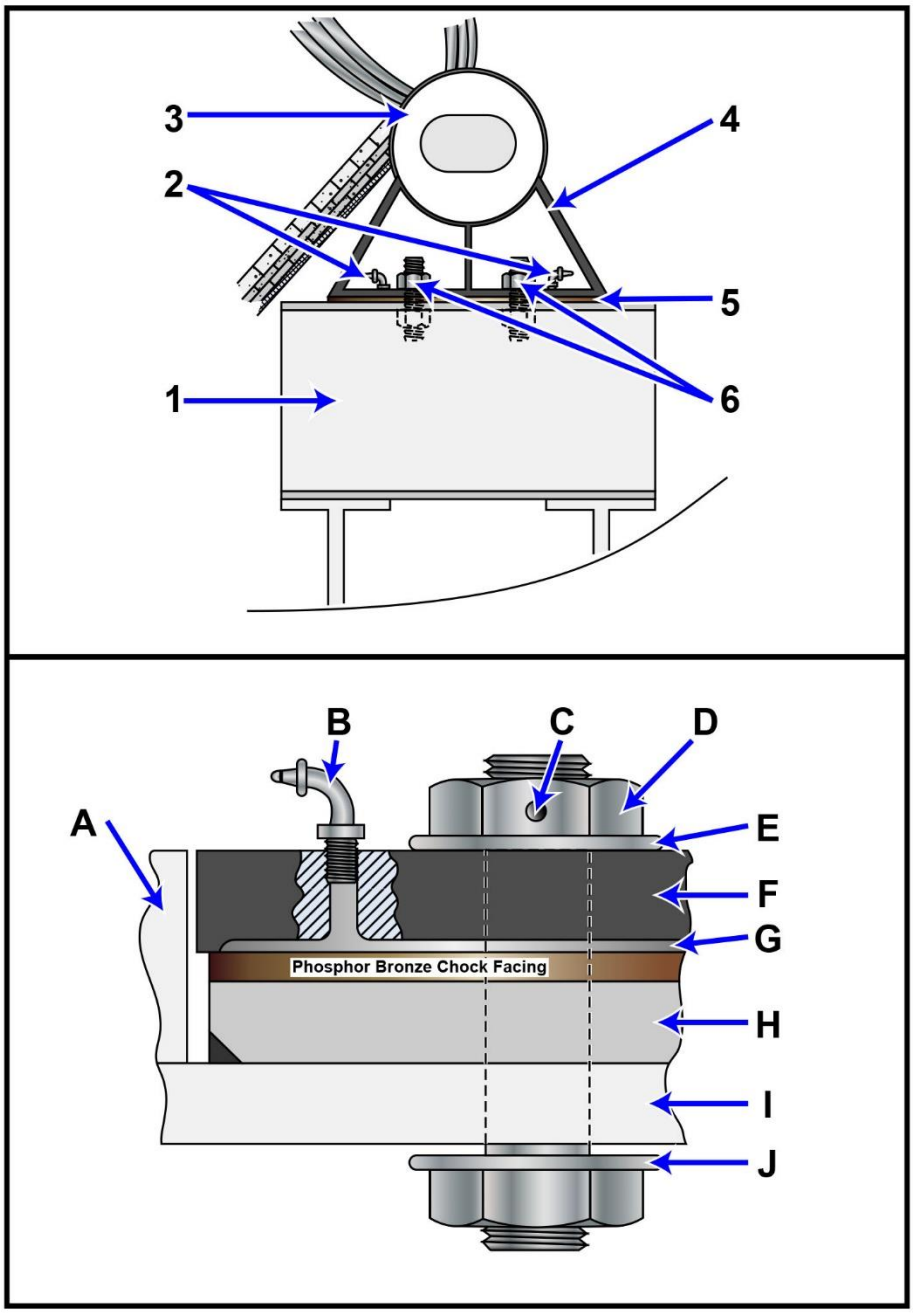

SG-0026

Properties of Saturated Steam

Vacuum Inches of Hg Gage	Temperature °C	Temperature °F
29.51	11.74	53.14
29.41	15.17	59.30
29.31	18.04	64.47
29.21	20.52	68.93
29.11	22.70	72.86
29.00	24.66	76.38
28.90	26.43	79.58
28.70	29.56	85.21
28.49	32.27	90.08
28.29	34.66	94.38
28.09	36.80	98.24
27.88	38.74	101.74
27.48	42.18	107.92
27.06	45.14	113.26
26.66	47.77	117.99
26.26	50.13	122.23
25.85	52.27	126.08
25.44	54.23	129.62
25.03	56.05	132.89
24.63	57.74	135.94
24.22	59.33	138.79
23.81	60.82	141.48
22.79	64.21	147.57
21.78	67.21	152.97
20.76	69.91	157.83
19.74	72.36	162.24
18.72	74.61	166.30
17.70	76.70	170.06
16.69	78.64	173.56
15.67	80.47	176.85
14.65	82.14	179.86
13.63	83.81	182.86
12.61	85.36	185.64
11.60	86.82	188.28
10.58	88.22	190.80
9.56	89.57	193.21
7.52	92.08	197.75
5.49	94.42	201.96
3.45	96.60	205.88
1.42	98.64	209.56