

U.S.C.G. Merchant Marine Exam

QMED

Q808 Pumpman

(Sample Examination)

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

1. When securing the operation of an inert gas system, the final step should be _____.
- A. secure the inert gas blower
 - B. close the deck isolating valve
 - C. secure the saltwater supply to the scrubber
 - D. close the flue gas isolating valve

Correct answer: C

2. Where is the location of a chain-operated valve when a chain wheel is attached to the stem and is associated with an endless chain for operation?
- A. The valve is located too far directly above the deck where it is operated from.
 - B. The valve is located too far directly across from the location where it is operated.
 - C. The valve is located too far directly below the deck where it is operated from.
 - D. A chain-operated valve can be used in any of the applications listed above.

Correct answer: A

3. When repacking a stuffing box fitted with a lantern ring, which of the following precautions should be observed?
- A. Block off the sealing water connection.
 - B. Be certain that all packing is fitted loosely to the shaft.
 - C. For good lubrication, apply a fine grade lapping compound between the shaft and packing.
 - D. Replace all of the packing rings.

Correct answer: D

4. A pump is defined as a device that _____.
- A. imparts energy to a fluid to move it from point "A" to point "B"
 - B. is to develop a pressure differential
 - C. creates a vacuum to move a liquid in all installations
 - D. produces pressure

Correct answer: A

5. The line labeled "C", as shown in the illustration, would be identified as the _____. Illustration GS-0175
- A. clean water flushing line
 - B. oily bilge water inlet
 - C. tank drain line
 - D. oil discharge line

Correct answer: A

6. Which type of pump would normally be used to transfer fairly large quantities of fluids at relatively low pressures?
- A. reciprocating type
 - B. gear type
 - C. propeller type
 - D. screw type
- Correct answer: C

7. Under what circumstances could equipment be operated when tagged with DANGER tags?
- A. Never
 - B. Whenever permission is granted by your supervisor
 - C. Whenever you feel that it is safe to do so
 - D. Whenever there is a break in the actual maintenance activity
- Correct answer: A

8. In order to take suction on the lube oil drain tank cofferdam with the bilge pump shown in the illustration, how many suction side valves must be open? Illustration GS-0042
- A. One
 - B. Two
 - C. Three
 - D. Four

Correct answer: B

9. The illustrated valve, figure "A", needs to be repaired due to a leak across the valve disk. To disassemble the valve you should _____. Illustration GS-0140
- A. tighten part 4
 - B. first fully loosen part 8, then turn the handwheel clockwise to separate the bonnet from the body
 - C. first fully loosen part 8, then turn the handwheel counter-clockwise to separate the bonnet from the body
 - D. turn the handwheel clockwise as viewed from the top, using a pipe wrench for assistance

Correct answer: B

10. What is the whistle signal for stop lowering boats?
- A. 1 short blast of the whistle
 - B. 2 short blasts of the whistle
 - C. 3 short blasts of the whistle
 - D. Continuous blast of the whistle for not less than 3 seconds

Correct answer: B

11. If item "1" shown in the illustration is a compound gauge indicating zero psig and the water level in the bilges is one foot high, the unit is _____. Illustration GS-0153
- A. in the oil discharge mode
 - B. processing the bilge water
 - C. damaged and should not be used
 - D. not turned on

Correct answer: D

12. After extinguishing a paint locker fire using the fixed CO₂ system, the next immediate action is for the space to be _____.
- A. opened and burned material removed
 - B. checked for the proper oxygen level
 - C. opened and doused with water to prevent reflash
 - D. left closed with ventilation off until all boundaries are cool

Correct answer: D

13. Which of the following extinguishing effects for dry chemical extinguishing agents is considered the most prevalent?
- A. smothering and removing the oxygen from the fuel
 - B. breaking up the molecular chain reaction
 - C. cooling the fuel below ignition temperature
 - D. removing the fuel by absorbing the heated vapors

Correct answer: B

14. The seat of a butterfly valve will most likely be constructed of _____.
- A. Monel
 - B. admiralty metal
 - C. a resilient material
 - D. stellite

Correct answer: C

15. Lube oil pumps taking suction from the sump of most small marine engines are usually _____.
- A. diaphragm type
 - B. eductor type
 - C. centrifugal type
 - D. positive displacement type

Correct answer: D

16. If for any reason it is necessary to abandon ship while far at sea, it is important for the crew members to _____.
- A. separate from each other as this will increase the chances of being rescued
 - B. get away from the area because sharks will be attracted to the vessel
 - C. immediately head for the nearest land
 - D. remain together in the area because rescuers will start searching at the vessel's last known position

Correct answer: D

17. What statement is true concerning the effect of elevating the temperature of the oily-water mixture associated with an oily-water separator?
- A. Heating the oily-water mixture increases the viscosity of the oil and decreases the specific gravity differential between the oil and water.
 - B. Heating the oily-water mixture decreases the viscosity of the oil and increases the specific gravity differential between the oil and water.
 - C. Heating the oily-water mixture decreases the viscosity of the oil and decreases the specific gravity differential between the oil and water.
 - D. Heating the oily-water mixture increases the viscosity of the oil and increases the specific gravity differential between the oil and water.

Correct answer: B

18. When required to work in an area where explosive gases may accumulate, you should use hand tools which are _____.
- A. high carbon steel
 - B. non-ferrous
 - C. fixed with a ferrous cover
 - D. approved by the Coast Guard

Correct answer: B

19. Spring reinforced oil seals for retention of lubricant, are installed with the lip of the seal facing _____ . Illustration GS-0152
- A. away from the oil pressure being sealed
 - B. away from the bearing housing recess
 - C. toward the oil pressure being sealed
 - D. toward the bearing preload washer

Correct answer: C

20. Petroleum vapors are dangerous _____.
- A. only if the vapor is between the upper and lower explosive limit
 - B. at all times due to their toxicity
 - C. only if the oxygen concentration is below 16 percent
 - D. only if the source of the vapor is above its flash point

Correct answer: B

21. What type of direct reading thermometer works on the principle of differential expansion of dissimilar metals as the temperature rises and features a rotary dial scale?
- A. Liquid-in-glass thermometer
 - B. Bourdon tube thermometer
 - C. Thermocouple pyrometer
 - D. Bimetallic thermometer

Correct answer: D

22. Babbitt is a metal alloy commonly used for lining _____.

- A. precision bearings
- B. shim stock
- C. saltwater piping
- D. valve seats

Correct answer: A

23. Which of the following methods applies to how a vacuum is created by a jet pump or an eductor?

- A. A reciprocating plunger directly applying force to a fluid
- B. Centrifugal force converted into potential energy
- C. A rapidly moving stream of fluid passing through a nozzle
- D. A propeller drawing a fluid through a Venturi nozzle

Correct answer: C

24. Which of the following statements is true concerning centrifugal pumps?

- A. They are always mounted in a horizontal position.
- B. They are started with the discharge valve opened.
- C. The flow of liquid is developed by imparting energy due to the rotation of an impeller.
- D. They are particularly suited for pumping high viscosity fluids.

Correct answer: C

25. What could be the cause of water hammer in a steam heating system?

- A. filling the auxiliary boiler with cold water
- B. steam admitted to a cold pipe
- C. filling the auxiliary boiler with hot water
- D. draining a sootblower line before cracking the steam supply valve

Correct answer: B

26. If an attempted light off of an idle boiler fails, what should be done?

- A. The fuel should be secured to the boiler and the furnace purged of combustible vapors with the forced draft fan before another light off attempt is made.
- B. Another light off attempt (just one) can be undertaken before any additional precautions need to be observed.
- C. Another light off attempt (with no limit) can be undertaken before any additional precautions need to be observed.
- D. The fuel should be secured to the boiler and the boiler allowed to remain idle for a few minutes before another light off attempt is made.

Correct answer: A

27. What is the best protection against hand injuries from pinch points associated with being required to perform maintenance or repairs on rotating machinery?

- A. Donning the appropriate head protection such as a hard hat
- B. Donning the appropriate hand protection such as work gloves
- C. Donning the appropriate foot protection such as steel-toed safety shoes
- D. Properly locking out and tagging out the machine before work begins

Correct answer: D

28. Copper tubing is manufactured and classified as type K, L, and M. Which type would offer the greatest wall thickness for a given nominal size?
- A. Type K
 - B. Type L
 - C. Type M
 - D. Type K, L and M have identical wall thicknesses

Correct answer: A

29. An acceptable method of temporarily sealing a crack formed in the hull of a vessel is to _____.
- A. shore up the crack with welded braces
 - B. drill holes at each end
 - C. tack weld a doubler plate over the crack
 - D. apply a patch of sheet packing backed by a strongback or shoring

Correct answer: D

30. An ullage reading is the distance from a given point at the _____.
- A. sounding tube to either side of the tank
 - B. top of the tank down to the bottom of the tank
 - C. top of the sounding tube down to the surface of the liquid
 - D. top of the liquid down to the tank bottom

Correct answer: C

31. A thread die will be easier to start if the end of the shaft to be threaded is slightly _____.
- A. reamed
 - B. chamfered
 - C. center drilled
 - D. peened

Correct answer: B

32. Fuel oil is regularly transferred to the day tank in order to _____.
- A. allow impurities to settle out of the fuel
 - B. allow for decanting of water
 - C. make fuel available for immediate use
 - D. all of the above

Correct answer: D

33. With regard to the number of passes through the tubes of shell-and-tube heat exchangers, what statement is true?
- A. In single-pass and two-pass heat exchangers, the inlet and outlet tube-side fluid connections are at the same end.
 - B. In two-pass and four-pass heat exchangers, the inlet and outlet tube-side fluid connections are at the same end.
 - C. In single-pass and two-pass heat exchangers, the inlet and outlet tube-side fluid connections are at opposite ends.
 - D. In two-pass and four-pass heat exchangers, the inlet and outlet tube-side fluid connections are at opposite ends.

Correct answer: B

34. In what application is a remote valve operator most likely to be located outside the machinery space when the valve itself is located within the machinery space?
- A. A valve located in a fuel oil transfer line
 - B. A valve located in a sea water cooling line
 - C. A valve located in a compressed air line
 - D. A valve located in a potable water transfer line

Correct answer: A

35. 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

36. Water ballast placed in a tank that has been crude oil washed, but not water rinsed, shall be regarded as _____.
- A. segregated ballast
 - B. crude oil
 - C. clean ballast
 - D. dirty ballast

Correct answer: D

37. Packing extremely soft grease into a roller bearing will cause _____.
- A. emulsification of the thickener additive
 - B. excessive channeling of the grease
 - C. gelling of the base oil
 - D. high temperatures to develop as result of churning

Correct answer: D

38. The line labeled "G", as shown in the illustration, would be identified as the _____. Illustration GS-0175

- A. separated oil outlet
- B. clean water flushing line
- C. processed bilge water outlet
- D. oily bilge water inlet

Correct answer: A

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

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

Correct answer: B

40. According to the illustrated steam tables, what would be the superheater outlet temperature if saturated steam at 400 psia was elevated 192.83°F? Illustration SG-0004

- A. 192.83°F
- B. 247.31°F
- C. 444.59°F
- D. 637.42°F

Correct answer: D

41. Excessive lost motion in the valve mechanism of a duplex reciprocating pump will cause the _____.

- A. pump to operate sluggishly
- B. pistons to stop in mid-stroke
- C. cushioning valves to wear
- D. pump to short stroke continuously at both ends of the stroke for both cylinders

Correct answer: A

42. You have abandoned ship and are in charge of a life raft. How much water per day should you permit each occupant to drink after the first 24 hours?

- A. 1 can
- B. 1 pint
- C. 1 quart
- D. 1 gallon

Correct answer: B

43. Which of the gases listed is the poisonous gas most likely to be found in a closed compartment involved in a fire?

- A. Carbon dioxide
- B. Hydrogen
- C. Carbon monoxide
- D. Nitrogen

Correct answer: C

44. You notice smoke coming from an open laundry room doorway, which smells like electrical insulation. After activating the fire alarm, which of the following would be the lowest action priority?
- A. Locate the nearest CO2 or dry chemical extinguisher.
 - B. Close the door to the room.
 - C. Break out the nearest fire hose.
 - D. Secure power to the washers and dryers.

Correct answer: C

45. Hydraulic cranes must be properly warmed-up before being operated because _____.
- A. hydraulic strainers operate only during the warm-up period
 - B. warm-up allows the relief valves to be properly tested
 - C. warm-up allows the hydraulic system to become charged with oil
 - D. warm-up allows the hydraulic fluid to reach proper viscosity

Correct answer: D

46. What type of grease is the most commonly used aboard ship?
- A. Calcium-based grease
 - B. Lime-based grease
 - C. Lithium-based grease
 - D. Aluminum-based grease

Correct answer: C

47. The principle personnel hazard unique to Halon fire extinguishers is _____.
- A. eye irritation produced immediately after discharge from cylinder
 - B. displacement of oxygen
 - C. skin irritation
 - D. inhaling toxic vapors produced when exposed directly to a flame for extended periods

Correct answer: D

48. 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. Orange flame
 - B. Golden yellow flame
 - C. Yellow flame
 - D. Dazzling white flame

Correct answer: D

49. You are fighting a class "B" fire with a portable dry chemical extinguisher. The discharge should be directed _____.
- A. over the top of the fire
 - B. at the main body of the fire
 - C. to bank off a bulkhead onto the fire
 - D. at the seat of the fire, starting near the edge

Correct answer: D

50. Treatment of heat exhaustion should consist of _____.

- A. moving to a shaded area and laying down
- B. bathing with rubbing alcohol
- C. placing patient in a tub of cold water
- D. all the above

Correct answer: A

51. The illustrated hydraulic pump graphic symbol is used to depict a _____. Illustration GS-0097

- A. two-stage pump unit
- B. series-flow pump unit
- C. double pump unit
- D. combined pump unit

Correct answer: C

52. A magnetic strainer is primarily used in diesel engine reduction gear oil systems to remove small particles of _____.

- A. ferrous materials
- B. acidic materials
- C. copper
- D. babbitt

Correct answer: A

53. When blowing tubes, what is the determining factor in deciding how many revolutions of rotation of a sootblower element are required?

- A. Sootblower elements are never rotated more than one revolution
- B. When the steam supply manifold drains blow clear
- C. When the scavenging air indicator shows clear
- D. When the smoke indicator (periscope) shows clear

Correct answer: D

54. If a fire hose is left unattended and under pressure with the nozzle shut off, the fire hose will _____.

- A. remain motionless
- B. burst under pressure
- C. become elongated by 125%
- D. lash about violently

Correct answer: A

55. Which of the listed diesel engine operating conditions should be checked immediately after any diesel engine is started?

- A. Lube oil level
- B. Exhaust temperature
- C. Water level in the expansion tank
- D. Lube oil pressure

Correct answer: D

56. After prior isolation and lock-out/tag-out procedures are performed, which electrical device requires discharging any stored electrical energy before any work may safely begin?

- A. choke coil
- B. resistor bank
- C. potential transformer
- D. capacitor

Correct answer: D

57. One disadvantage of using a mechanical shaft seal instead of mechanical packing is that _____.

- A. it requires periodic disassembly and adjustment
- B. it is unsuitable for high temperature applications
- C. it is unsuitable for high-pressure applications
- D. seal failure usually requires the immediate removal of the pump from service

Correct answer: D

58. Annual servicing of a hand portable CO₂ fire extinguisher includes _____.

- A. hydrostatic testing of the cylinder
- B. inspecting the pressure gauge to ensure the needle is within operating range
- C. weighing the cylinder and recharging if weight loss exceeds 10% of the weight of the charge
- D. discharging, cleaning inside, and recharging

Correct answer: C

59. With regard to the relative flow patterns through the tubes and the shell of single pass shell-and-tube heat exchangers, what statement is true?

- A. In a counterflow heat exchanger, the flow through the tubes and the flow through the shell are in opposite directions.
- B. In a counterflow heat exchanger, the flow through the tubes and the flow through the shell are in the same direction.
- C. In a crossflow heat exchanger, the flow through the tubes and the flow through the shell are in opposite directions.
- D. In a parallel-flow heat exchanger, the flow through the tubes and the flow through the shell are in opposite directions.

Correct answer: A

60. A spur gear pump should be operated with the discharge valves _____.

- A. slightly opened
- B. throttled
- C. halfway opened
- D. fully opened

Correct answer: D

61. Positive displacement, helical gear pumps are well suited for pumping oil because _____.

- A. it is not necessary to closely maintain design clearances with this pump
- B. they are essentially self-priming and capable of a high suction lift
- C. these pumps are designed with extreme tooth angles
- D. stuffing boxes eliminate the leakage problems usually associated with other gear pumps

Correct answer: B

62. After an emergency shoring installation has been completed, the _____.

- A. timbers are nailed in place to prevent looseness
- B. damaged plating should be straightened by heating
- C. repair is completed and no further action is needed
- D. shoring should be frequently inspected for looseness

Correct answer: D

63. 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 engine rotation reversal and reduction gears can be used for multiple propeller shaft outputs.
- C. Reduction gears can be used for propeller thrust 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

64. The Muster List ("Station Bill") shows each crew lifeboat station, their duties during abandonment, basic instructions, and _____.

- A. the time each weekly drill will be held
- B. work schedule
- C. all emergency signals
- D. instructions for lowering the survival capsule

Correct answer: C

65. Basic emergency care for an electrical burn is to _____.

- A. flood the burn with water for two minutes
- B. cover the burned area with a clean cloth and transport the patient to a medical facility
- C. apply ointment or spray to the burned area and wrap with a clean cloth
- D. brush away the charred skin and wrap the burned area

Correct answer: B

66. When piston rod packing persists in leaking on a reciprocating steam pump, the cause may be _____.

- A. clogged suction strainers
- B. misalignment of the crosshead guide
- C. an open snifter valve
- D. a loose tappet collar

Correct answer: B

67. The component, which is used to thoroughly separate small, fine, dust-like particulate contamination from hydraulic fluid is a/an _____.

- A. strainer
- B. accumulator
- C. separator
- D. filter

Correct answer: D

68. The proper location for journal bearing oil grooves is _____.

- A. at the bottom of the bearing
- B. in the region of the load bearing surface
- C. halfway between bottom and where shells meet
- D. as a side relief where the two shells meet

Correct answer: D

69. Which of the following is an example of a solid bearing?

- A. Thrust bearing
- B. Piston pin bushing
- C. Turbo-generator turbine bearing
- D. Spring bearing

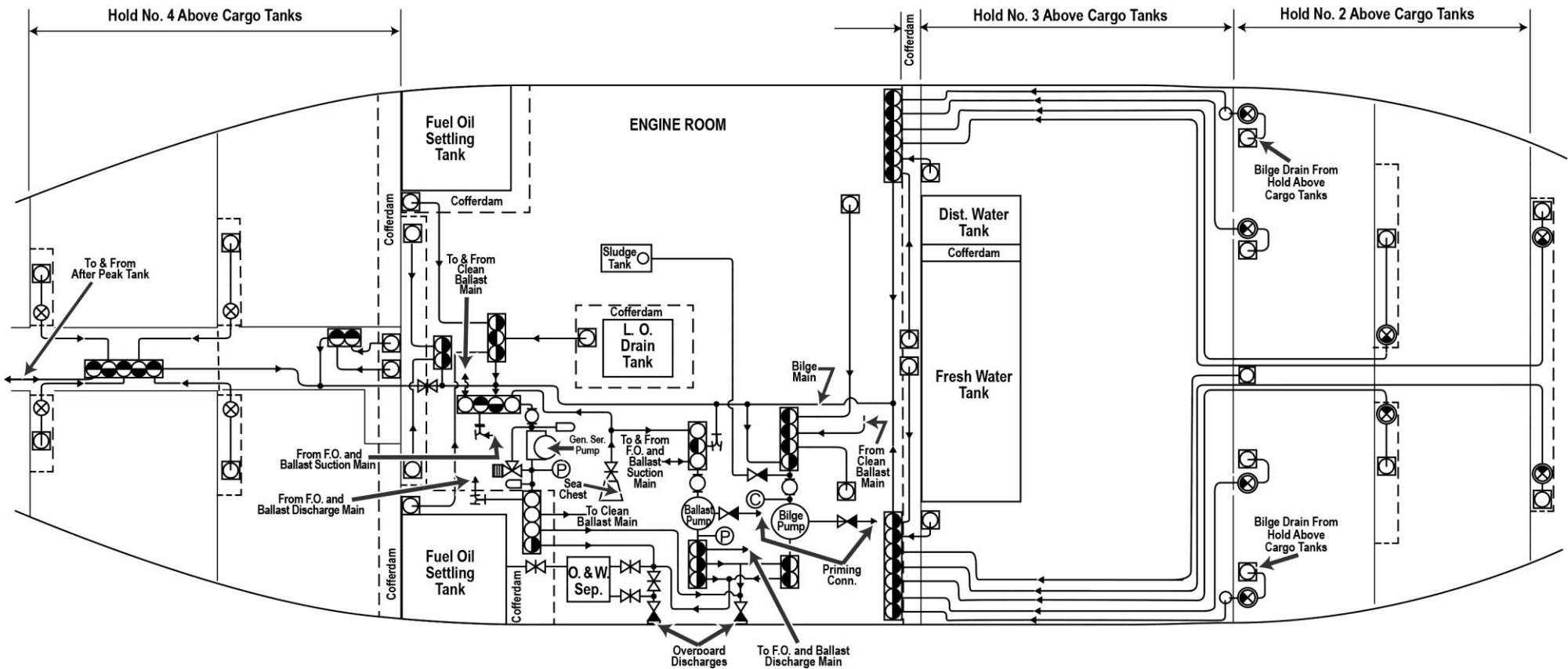
Correct answer: B

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

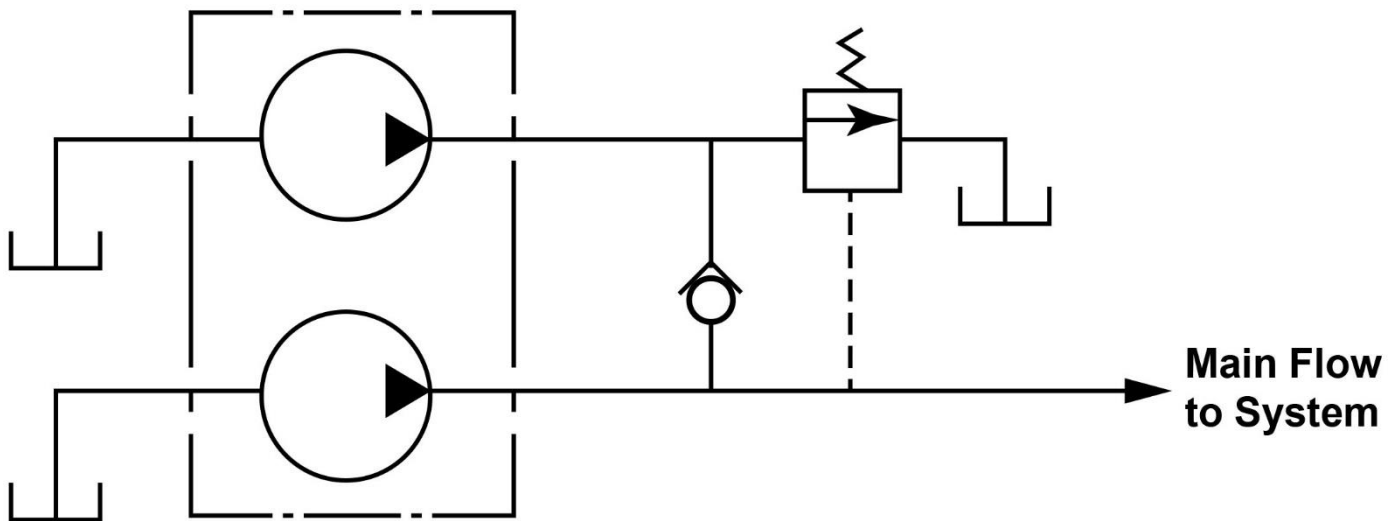
Correct answer: B

GS-0042



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GS-0097



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GS-0140

Figure A

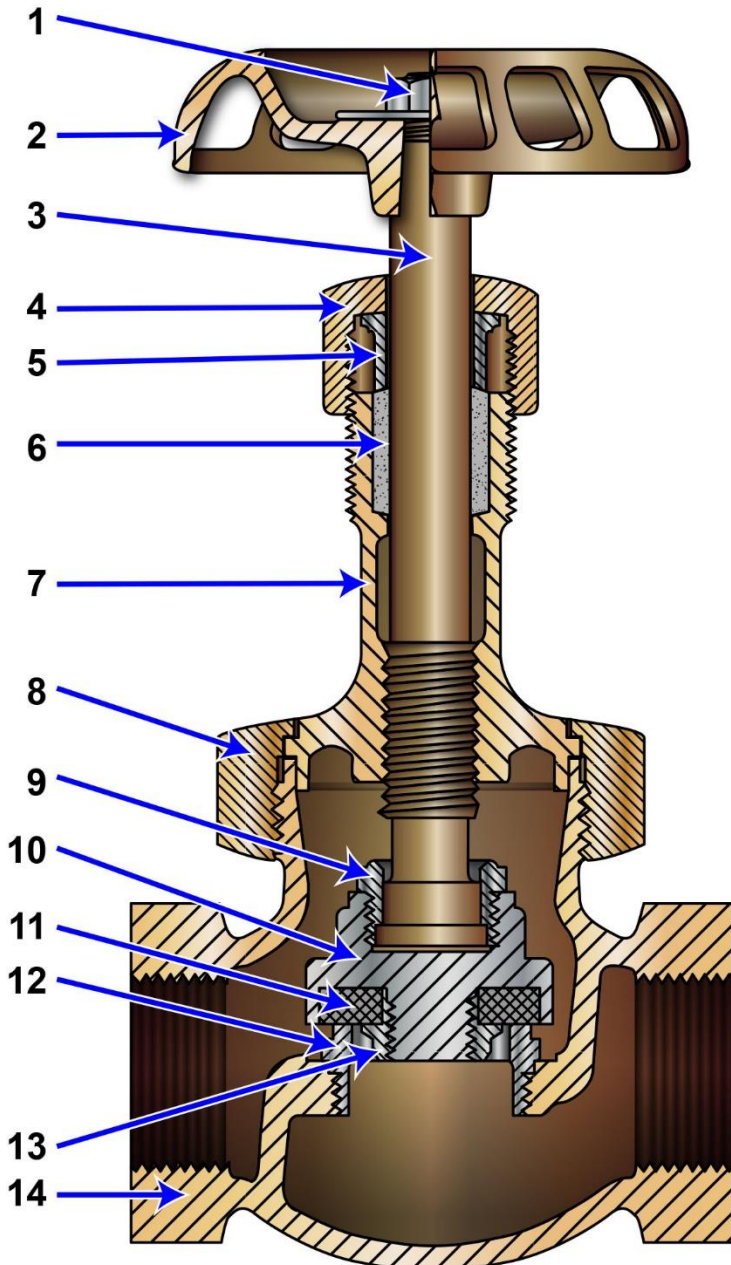
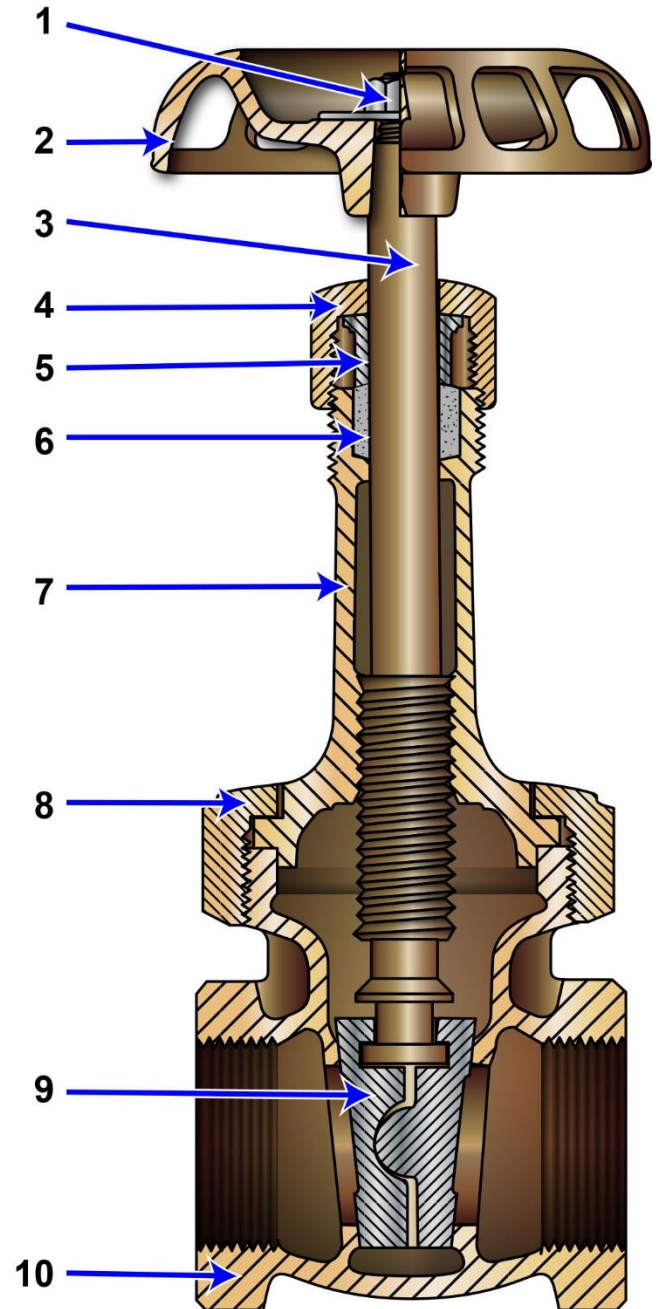
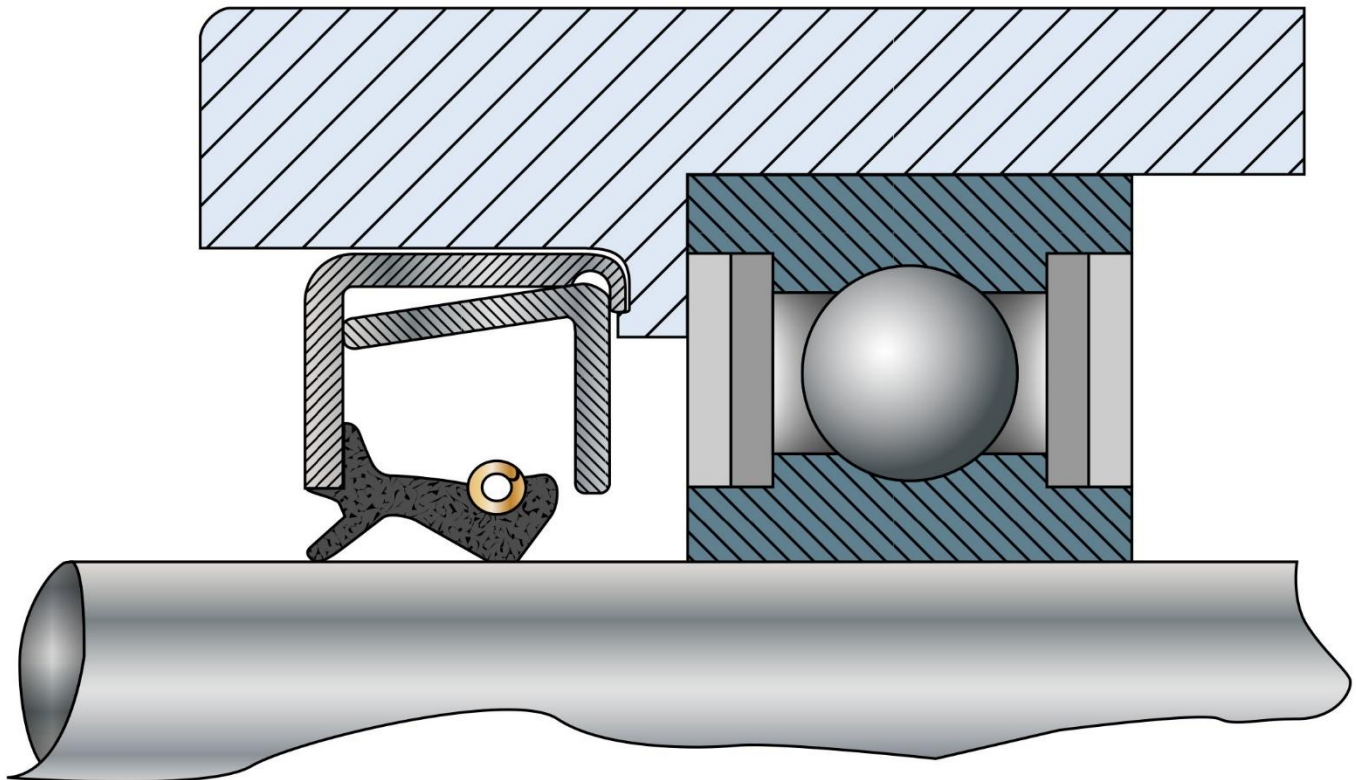


Figure B



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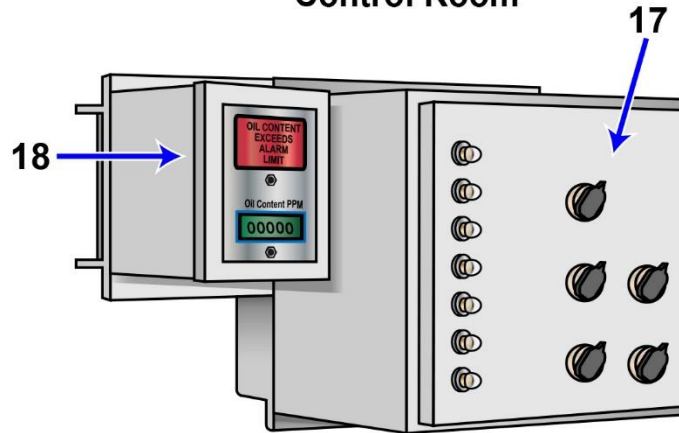
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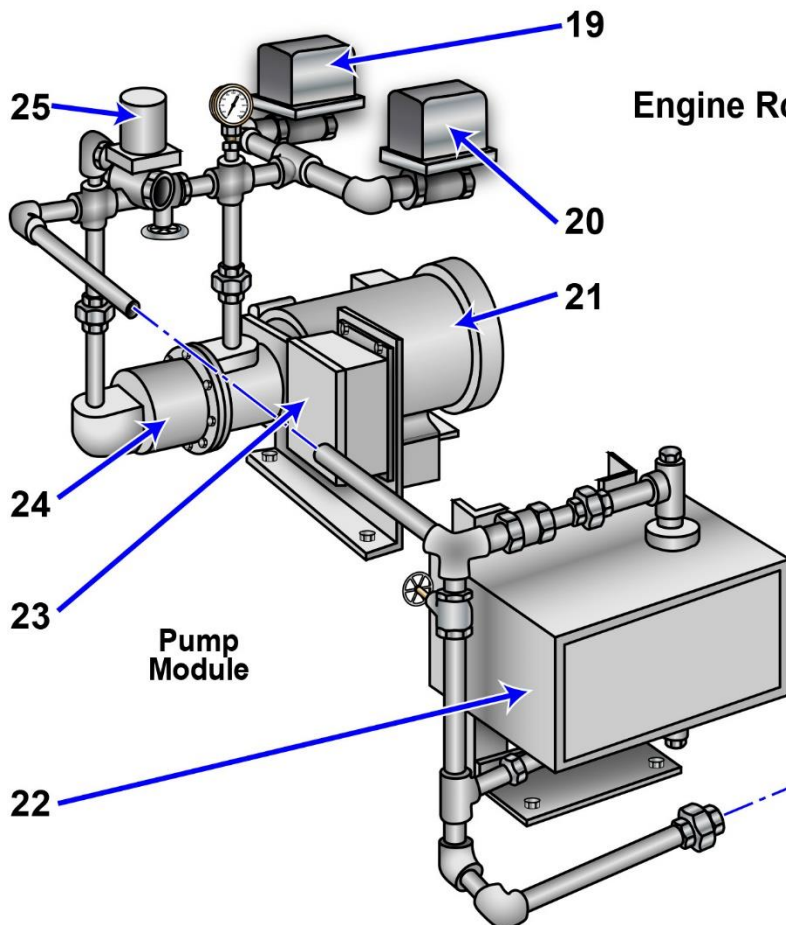
GS-0153

Control Room

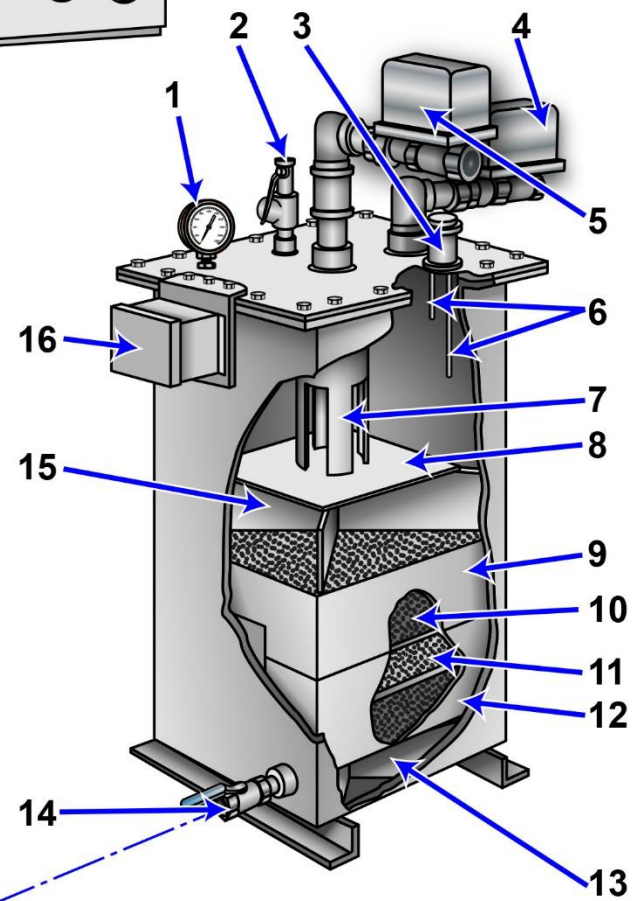


Control Panel
Assembly

Engine Room



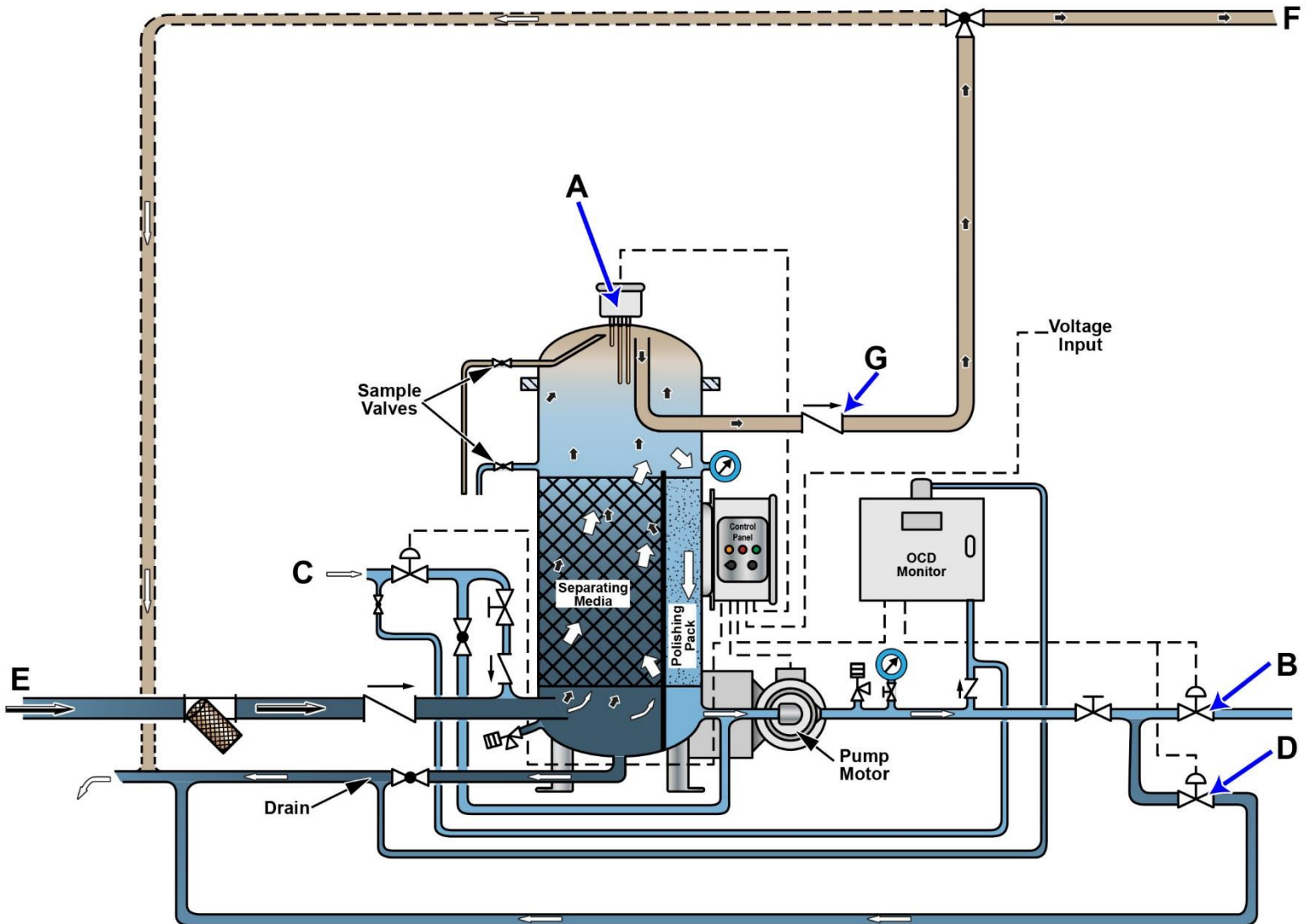
Pump
Module



Separator Tank
Module

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Repair Parts and Special Tools List for Oil Water Separator
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GS-0175



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SG-0004

Table 1
Thermodynamic Properties of Saturated Steam (Temperature)

Temp, °F	Absolute Pressure, psi	Enthalpy (BTU/lb) of Liquid	Enthalpy (BTU/lb) of Evaporation	Enthalpy (BTU/lb) of vapor
32	0.08859	0.01	1075.5	1075.5
40	0.12170	8.05	1071.3	1079.3
50	0.17811	18.07	1065.6	1083.7
60	0.25630	28.06	1059.9	1088.0
70	0.36310	38.04	1054.3	1092.3
80	0.50690	43.02	1048.6	1096.6
90	0.69820	57.99	1042.9	1100.9
100	0.94920	67.97	1037.2	1105.2
110	1.27480	77.94	1031.6	1109.5
120	1.69240	87.92	1025.8	1113.7
130	2.22250	97.90	1020.0	1117.9
140	2.88860	107.90	1014.1	1122.0
150	3.71800	117.90	1008.2	1126.1
160	4.74100	127.90	1002.3	1130.2
170	5.99200	137.90	996.3	1134.2
180	7.51000	147.90	990.2	1138.1
190	9.33900	157.90	984.1	1142.0
200	11.52600	168.00	977.9	1145.9
212	14.69600	180.00	970.4	1150.4
220	17.18600	188.10	965.2	1153.4
240	24.96900	208.30	952.2	1160.5
280	49.20300	249.10	924.7	1173.8
300	67.01300	269.60	910.1	1179.7
340	118.01000	311.10	879.0	1190.1
380	195.77000	353.50	844.6	1198.1
400	247.31000	375.00	826.0	1201.0

Table 2
Thermodynamic Properties of Saturated Steam (Pressure)

Absolute Pressure, psi	Temp, °F	Enthalpy (BTU/lb) of Liquid	Enthalpy (BTU/lb) of Evaporation	Enthalpy (BTU/lb) of vapor
0.5	79.58	47.6	1048.8	1096.4
1.0	101.74	69.7	1036.3	1106.0
5.0	162.24	130.1	1001.0	1131.1
10.0	193.21	161.2	982.1	1143.3
14.7	212.00	180.0	970.4	1150.4
15.0	213.03	181.1	969.7	1150.8
20.0	227.96	196.2	960.1	1156.3
25.0	240.07	208.5	952.1	1160.6
30.0	250.33	218.8	945.3	1164.1
40.0	267.25	236.0	933.7	1169.7
50.0	281.01	250.1	924.0	1174.1
60.0	292.71	262.1	915.5	1177.6
70.0	302.92	272.6	907.9	1180.6
80.0	312.03	282.0	901.1	1183.1
90.0	320.27	290.6	894.7	1185.3
100.0	327.81	298.4	888.8	1187.2
110.0	334.77	305.7	883.2	1188.9
120.0	341.25	312.4	877.9	1190.4
130.0	347.32	318.8	872.9	1191.7
140.0	353.02	324.8	868.2	1193.0
150.0	358.42	330.5	863.6	1194.1
200.0	381.79	355.4	843.0	1198.4
250.0	400.95	376.0	825.1	1201.1
300.0	417.33	393.8	809.0	1202.8
350.0	431.72	409.7	794.2	1203.9
400.0	444.59	424.0	780.5	1204.5

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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

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