

U.S.C.G. Merchant Marine Exam

QMED

Q808 Pumpman

(Sample Examination)

Choose the best answer to the following Multiple Choice Questions.

1. An eroded globe valve disk can be repaired by _____.

- (A) taking a light cut in a lathe
- (B) sandblasting with lightweight grit
- (C) scraping with a bastard file
- (D) dressing the seat with crocus cloth

If choice A is selected set score to 1.

2. Which of the following descriptions should be included when identifying the length for pipe nipples?

- (A) Standard, extra-strong, double extra-strong, and schedule 80
- (B) Close, short, long, and tank
- (C) Cast, wrought, stainless, and brass
- (D) Fully threaded, half threaded, long, and short

If choice B is selected set score to 1.

3. In what application is an emergency shutdown most likely to be located outside the machinery space when the pump itself is located within the machinery space?

- (A) Fuel oil transfer pump
- (B) Steering pump
- (C) Lube oil circulating pump
- (D) Fire pump

If choice A is selected set score to 1.

4. To anneal a copper gasket, you should heat the gasket _____.

- (A) and let cool slowly in the air
- (B) and quench it in oil
- (C) and carbonize it
- (D) cherry red and quench in water

If choice D is selected set score to 1.

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

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

If choice D is selected set score to 1.

6. An inadequate reciprocating bilge pump discharge is most often caused by _____.

- (A) clogged suction strainers
- (B) clogged drain valves
- (C) scarred cylinder walls
- (D) defective intake valves

If choice A is selected set score to 1.

7. Before making up a flanged joint, you should _____.

- (A) cut grooves in the flange face with a chisel
- (B) be certain that the flanges line up squarely
- (C) heat the pipeline to expand the bolt holes
- (D) have a second spare gasket on hand

If choice B is selected set score to 1.

8. During topping off of bunker tanks, the loading rate must be personally supervised by the _____.

- (A) person in charge
- (B) master
- (C) chief engineer
- (D) terminal operator

If choice A is selected set score to 1.

9. A pump is defined as a device that _____.

- (A) produces pressure
- (B) creates a vacuum to move a liquid in all installations
- (C) is to develop a pressure differential
- (D) imparts energy to a fluid to move it from point "A" to point "B"

If choice D is selected set score to 1.

10. 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) A rapidly moving stream of fluid passing through a nozzle.
- (C) A propeller drawing a fluid through a Venturi nozzle.
- (D) Centrifugal force converted into potential energy.

If choice B is selected set score to 1.

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

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

If choice C is selected set score to 1.

12. With all other factors considered equal (such as voltage, conducting path through the body and the duration of contact), contact with an energized electrical system conductor of which system type would produce the most damaging effect?

- (A) DC systems
- (B) 60 Hz AC systems
- (C) 10 kHz AC systems
- (D) All the above systems would be equally as damaging

If choice B is selected set score to 1.

13. When repacking a reciprocating pump with more than four rings of packing, the packing is cut square, installed with the ends abutted, and each succeeding ring staggered with the butted ends _____.

- (A) 45° apart
- (B) 90° apart
- (C) 120° apart
- (D) 180° apart

If choice B is selected set score to 1.

14. When the scuppers are plugged and an oil spill occurs on deck, you should _____.

- (A) remove plugs from scuppers and wash fuel overboard with water
- (B) use absorbent material, such as sawdust, to clean up the spill
- (C) remove plugs from scuppers and wash the fuel overboard with a solvent
- (D) remove plugs from scuppers to allow the spill to run overboard and wipe the area dry with rags

If choice B is selected set score to 1.

15. Fire hoses located at protected fire stations must always be _____.

- (A) capped on the ends for protection
- (B) supplied with a smooth bore nozzle
- (C) connected to the fire hydrant
- (D) open to the air to prevent rot

If choice C is selected set score to 1.

16. 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) Break out the nearest fire hose.
- (C) Close the door to the room.
- (D) Secure power to the washers and dryers.

If choice B is selected set score to 1.

17. What is meant by the phrase "solid flooding"?

- (A) A compartment completely filled from deck to overhead, with every cubic foot of the compartment occupied by some solid material.
- (B) A compartment completely filled from deck to overhead, with every cubic foot of the compartment occupied by flooding water.
- (C) A compartment nearly filled from deck to overhead, with nearly every cubic foot of the compartment occupied by flooding water, the remainder by the trapped air on the bottom.
- (D) A compartment nearly filled from deck to overhead, with nearly every cubic foot of the compartment occupied by flooding water, the remainder by the trapped air on top.

If choice B is selected set score to 1.

18. In the system illustrated, which of the following readings should be indicated on the pressure gage, if the load (x) is 8000 lbs (3632 kg) and the piston area (y) is 10 sq. in (64.5 sq. cm)? Illustration GS-0062

- (A) 80 psi (5.63 kg/cm²)
- (B) 800 psi (56.31 kg/cm²)
- (C) 8,000 psi (563.1 kg/cm²)
- (D) 80,000 psi (5631 kg/cm²)

If choice B is selected set score to 1.

19. The output volume of a positive fixed displacement pump can be changed only by _____.

- (A) changing the angle of the tilting plate
- (B) moving the shaft trunnion block
- (C) changing the speed of the pump
- (D) moving the slide block and rotor

If choice C is selected set score to 1.

20. A tank has been sealed and unventilated for a long period of time. Which of the following statements is true?

- (A) The tank is especially dangerous to enter.
- (B) Carbon monoxide is present.
- (C) Water vapor present when the tank was sealed has oxidized.
- (D) The tank is safe to enter.

If choice A is selected set score to 1.

21. What should be done if localized scoring is discovered on a pump shaft sleeve during routine maintenance inspection?

- (A) Reassemble the pump and provide more water leak off for lubrication.
- (B) Reassemble the pump and set the governor to obtain a slower speed.
- (C) Check for parallel alignment of the sleeve radial face to the sleeve bore.
- (D) Correct the cause of scoring and install a new shaft sleeve.

If choice D is selected set score to 1.

22. To safely remove the piston rod packing from the steam end of a reciprocating pump, you should _____.

- (A) use a packing hook
- (B) open the steam chest and pry the packing loose with a scraper
- (C) open the throttle valve and 'blow' the old packing out
- (D) do nothing, as this type of pump utilizes O-rings in lieu of packing

If choice A is selected set score to 1.

23. As demand on the device shown in the illustration fluctuates in the pressure range of 100 to 110 psi, the output of the unit is controlled by _____. Illustration GS-0119

- (A) the modulation of the opening of a butterfly valve located in the air intake
- (B) change in control pressure to modulate the discharge of compressed air to the atmosphere
- (C) complete shut down until the lower pressure limit is reached causing it to restart
- (D) proportional modulation of the compressor speed

If choice A is selected set score to 1.

24. You suspect a problem with the centrifugal fire pump on your ship, and begin to slowly close the discharge valve. Your suspicion is confirmed when the _____.

- (A) suction valve is closed off, and the discharge pressure begins to decrease
- (B) suction valve is closed off, yet the relief valve does not lift
- (C) discharge valve is 80% closed and the relief valve lifts
- (D) discharge valve is closed off and there is no change in the discharge pressure

If choice D is selected set score to 1.

25. The pressure of a liquid leaving the pump can be referred to as the _____.

- (A) discharge head
- (B) total head
- (C) suction head
- (D) net positive suction head

If choice A is selected set score to 1.

26. The function of item "7" shown in the illustration is to _____. Illustration GS-0153

- (A) direct the flow of the oily-water mixture against the coalescer bed
- (B) support the tank access panel
- (C) prevent separated oil from mixing with the incoming bilge water
- (D) allow the oil accumulated to exit the device, while remaining separated from the liquid

If choice C is selected set score to 1.

27. Where will you find the procedures for the reporting of oil discharge into the water?

- (A) The vessel's Certificate of Inspection
- (B) The vessel's Oil Transfer Procedures
- (C) The vessel's Oil Record Book
- (D) The vessel's International Oil Pollution Prevention Certificate

If choice B is selected set score to 1.

28. After cutting a piece of tubing to be flared, you should _____.

- (A) crimp the tube end in order to slip on the fitting
- (B) flare the tube before removing the burrs
- (C) rough up the outside surface of the tube end with a file
- (D) remove inside burrs with a reamer

If choice D is selected set score to 1.

29. Accidental flooding of the engine room bilges through the bilge system is prevented by _____.

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

If choice D is selected set score to 1.

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

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

If choice C is selected set score to 1.

31. Reduced capacity, accompanied by vibration and noise at the suction of a centrifugal pump, results from cavitation in the fluid being pumped. Cavitation describes the formation of _____.

- (A) vapor pockets
- (B) steam knock
- (C) fluid friction
- (D) water hammer action

If choice A is selected set score to 1.

32. If a cargo tank has not been certified as gas free, _____.

- (A) breathing apparatus would not be necessary in an emergency as you would only be in the tank a short time
- (B) a man may work safely without breathing apparatus in cold weather, as vapors are less volatile
- (C) entry without a breathing apparatus may be made at the top of the tank since petroleum vapors are heavier than air
- (D) breathing apparatus should always be used

If choice D is selected set score to 1.

33. The discharge capacity of the axial piston hydraulic pump, shown in the illustration, is _____.
Illustration GS-0058

- (A) increased by adding a shorter cylinder block
- (B) fixed by the pump housing angle
- (C) decreased by adding a longer cylinder block
- (D) increased by adding a longer cylinder block

If choice B is selected set score to 1.

34. In the starting process of a diesel engine, the main object is to attain the compression conditions sufficient to _____.

- (A) turn the flywheel
- (B) ignite the fuel
- (C) reduce friction
- (D) overcome inertia

If choice B is selected set score to 1.

35. To operate a carbon dioxide extinguisher having the type of head shown in the illustration, you would _____. Illustration SF-0008

- (A) pull pin, open valve, and pull up on release lever
- (B) pull pin and open valve
- (C) open valve, pull pin, and pull up on release lever
- (D) open valve and pull pin

If choice B is selected set score to 1.

36. A good approach to personnel safety is to assume that all tanks and pump rooms are potentially dangerous. You should immediately leave an area whenever _____.

- (A) you experience an abnormal bodily sensation
- (B) you have irritation of the eyes, nose, or throat
- (C) you smell an unusual odor
- (D) any of the above conditions occur

If choice D is selected set score to 1.

37. When renewing spiral packing in a centrifugal pump stuffing box, after the packing is firmly seated, the packing gland nuts should be _____.

- (A) loosened, and then retightened with the pump running under normal conditions
- (B) loosened until the gland clears the stuffing box
- (C) left in that position
- (D) tightened an additional 10% to compress the packing

If choice A is selected set score to 1.

38. The suction-force principle of operation is a typical characteristic of _____.

- (A) centrifugal pumps
- (B) jet pumps
- (C) reciprocating pumps
- (D) propeller pumps

If choice C is selected set score to 1.

39. The illustrated valve is known as a _____. Illustration GS-0056

- (A) swing globe valve
- (B) butterfly lift valve
- (C) lift gate valve
- (D) swing check valve

If choice D is selected set score to 1.

40. Which of the listed types of seals is used effectively for pumps handling toxic or highly flammable liquids that cannot be permitted to escape into the atmosphere?

- (A) Conventional stuffing box
- (B) Double mechanical seal
- (C) Rubber bellows mechanical seal
- (D) External mechanical seal

If choice B is selected set score to 1.

41. What is an engine room bilge oily-water separator designed to do?

- (A) Remove small amounts of oil from large amounts of water.
- (B) Remove small amounts of water from small amounts of oil.
- (C) Remove small amounts of water from large amounts of oil.
- (D) Remove small amounts of oil from small amounts of water.

If choice A is selected set score to 1.

42. A pump shaft that is bent or distorted should normally be _____.

- (A) reconditioned by metalizing and machining
- (B) straightened by applying heat and torsion
- (C) replaced with a satisfactory spare
- (D) repaired by a suitable welding process

If choice C is selected set score to 1.

43. One of the consequences in continuing to operate a centrifugal bilge pump with the discharge valve closed, is that the _____.

- (A) motor overload will open
- (B) motor will overheat
- (C) relief valve will open
- (D) pump will overheat

If choice D is selected set score to 1.

44. Suppose a remote valve operator is fitted with a gearbox. What is the purpose of the gearbox?

- (A) The gearbox may be used to change the orientation of the hand wheel to the valve stem, or it may be used to reduce the turning effort, but NEVER both.
- (B) The gearbox may be used to change the orientation of the hand wheel to the valve stem, or it may be used to reduce the turning effort, OR both.
- (C) The gearbox is strictly used to change the orientation of the hand wheel to the valve stem. The gearbox is never used to reduce the turning effort.
- (D) The gearbox is strictly used to reduce the turning effort. The gearbox is never used to change the orientation of the hand wheel to the valve stem.

If choice B is selected set score to 1.

45. 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

If choice A is selected set score to 1.

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

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

If choice C is selected set score to 1.

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

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

If choice B is selected set score to 1.

48. The tool used to prepare copper tubing for the installation of fittings is called a _____.

- (A) flaring tool
- (B) spreader
- (C) stretcher
- (D) swaging tool

If choice A is selected set score to 1.

49. Which of the pumping systems listed for use aboard ship will most likely use a propeller type pump?

- (A) Fuel oil service booster system
- (B) Fluid power transmission system
- (C) Steering gear system
- (D) Main circulating system

If choice D is selected set score to 1.

50. Small oil spills on deck can be prevented from contaminating any waters by _____.

- (A) regularly emptying all drip pans
- (B) plugging all scuppers and drains
- (C) placing floating booms around the ship
- (D) thoroughly draining all bunkering hoses

If choice B is selected set score to 1.

51. "Prussian Blue" is commonly used _____.

- (A) for boiler water treatment
- (B) for cooling water treatment
- (C) when inspecting valve seat contact
- (D) as a lube oil additive

If choice C is selected set score to 1.

52. A gate valve installed in a piping system should be used _____.

- (A) to throttle the flow of liquid
- (B) only for lube oil service
- (C) only with the stem facing down
- (D) in either fully closed or fully opened positions

If choice D is selected set score to 1.

53. Item "B" shown in the illustrated hydraulic circuit is used to _____. Illustration GS-0103

- (A) shut down the remotely operated electric motor driven pump when the watertight door has closed
- (B) act as a power source to operate the pumps indicated as "F"
- (C) act as a power source to operate the pump indicated as "E"
- (D) shut down the operation of pump "E" when the watertight door has closed

If choice A is selected set score to 1.

54. In an emergency, a hole in the hull below the waterline, not over three inches in diameter, can be temporarily sealed by _____.

- (A) welding over a plate patch
- (B) using a soft wooden plug
- (C) stuffing a mattress in the hole
- (D) rigging a collision mat

If choice B is selected set score to 1.

55. A pounding noise occurring in one cylinder of a steam reciprocating general service pump could be caused by _____.

- (A) lower than normal supply steam pressure
- (B) improper adjustment of steam cushion valves
- (C) loss of air charge in the pump discharge plenum chamber
- (D) lower than normal supply steam temperature

If choice B is selected set score to 1.

56. Energy losses occurring in a hydraulic system are ultimately absorbed by the _____.

- (A) reservoir expansion chamber
- (B) hydraulic piping flexibility
- (C) atmosphere as heat
- (D) fluid as friction

If choice C is selected set score to 1.

57. Which of the listed devices would be installed at a control system air pressure reducing station?

- (A) Non-return valve
- (B) Vacuum breaker
- (C) Lubricator
- (D) Moisture separator

If choice D is selected set score to 1.

58. If both the shell-and-tube lube oil cooler and shell-and-tube jacket water cooler of a diesel engine are sea water-cooled, what statement is true?

- (A) Sea water flows through the shells of both the lube oil and jacket water coolers.
- (B) Sea water flows through the tubes of the lube oil cooler and through the shell of the jacket water cooler.
- (C) Sea water flows through the tubes of the jacket water cooler and through the shell of the lube oil cooler.
- (D) Sea water flows through the tubes of both the lube oil and jacket water coolers.

If choice D is selected set score to 1.

59. Which of the listed pumps, shown in the illustration, discharges directly to the fuel oil settling tanks of a diesel engine main propulsion plant? Illustration MO-0058

- (A) Booster pump
- (B) Transfer pump
- (C) Auxiliary bilge pump
- (D) Centrifuge transfer and discharge pumps

If choice B is selected set score to 1.

60. Which of the following modes of heat transfer does NOT require any physical contact between a warmer and a cooler substance?

- (A) Lamination
- (B) Radiation
- (C) Conduction
- (D) All of the above

If choice B is selected set score to 1.

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

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

If choice A is selected set score to 1.

62. Which of the illustrations depicts the correct procedure for applying pipe dope? Illustration GS-0046

- (A) A
- (B) B
- (C) C
- (D) D

If choice B is selected set score to 1.

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

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

If choice C is selected set score to 1.

64. Which of the listed devices is used to control the admission of steam to the steam cylinder of a reciprocating pump?

- (A) Valve operating differential
- (B) Pilot valve and operating rod
- (C) Pump rod
- (D) Crosshead arm

If choice B is selected set score to 1.

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

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

If choice A is selected set score to 1.

66. Which of the devices listed is used to maintain a snug interface between the rotating and stationary seal members shown in the illustration? Illustration GS-0071

- (A) notch and keyway
- (B) bellows
- (C) spring
- (D) seal retaining ring

If choice C is selected set score to 1.

67. Water ballast placed in a tank that has been crude oil washed, but not water rinsed, shall be regarded as _____.

- (A) segregated ballast
- (B) dirty ballast
- (C) crude oil
- (D) clean ballast

If choice B is selected set score to 1.

68. Which of the following statements is true concerning the overboard discharge of vessel sewage at sea?

- (A) The vessel may discharge sewage into the sea, from an approved system which is not comminuted or disinfected, only if the vessel is more than 12 nautical miles from the nearest land.
- (B) The vessel must have an approved sewage plant.
- (C) The vessel may discharge disinfected and comminuted sewage into the sea, from an approved system, only if the vessel is more than three nautical miles from the nearest land.
- (D) All of the above.

If choice D is selected set score to 1.

69. When replacing a gasket in a six-bolt flanged joint, in what order should the bolts be tightened?

- (A) Install and tighten bolts in pairs which are opposite each other in the flange (1-4, 2-5, and 3-6).
- (B) Each bolt should be installed and tightened in consecutive order in the counter-clockwise direction.
- (C) Each bolt should be installed and tightened in consecutive order in the clockwise direction.
- (D) Install and tighten bolts 1, 3, 4, 2, 5, and 6, in that order.

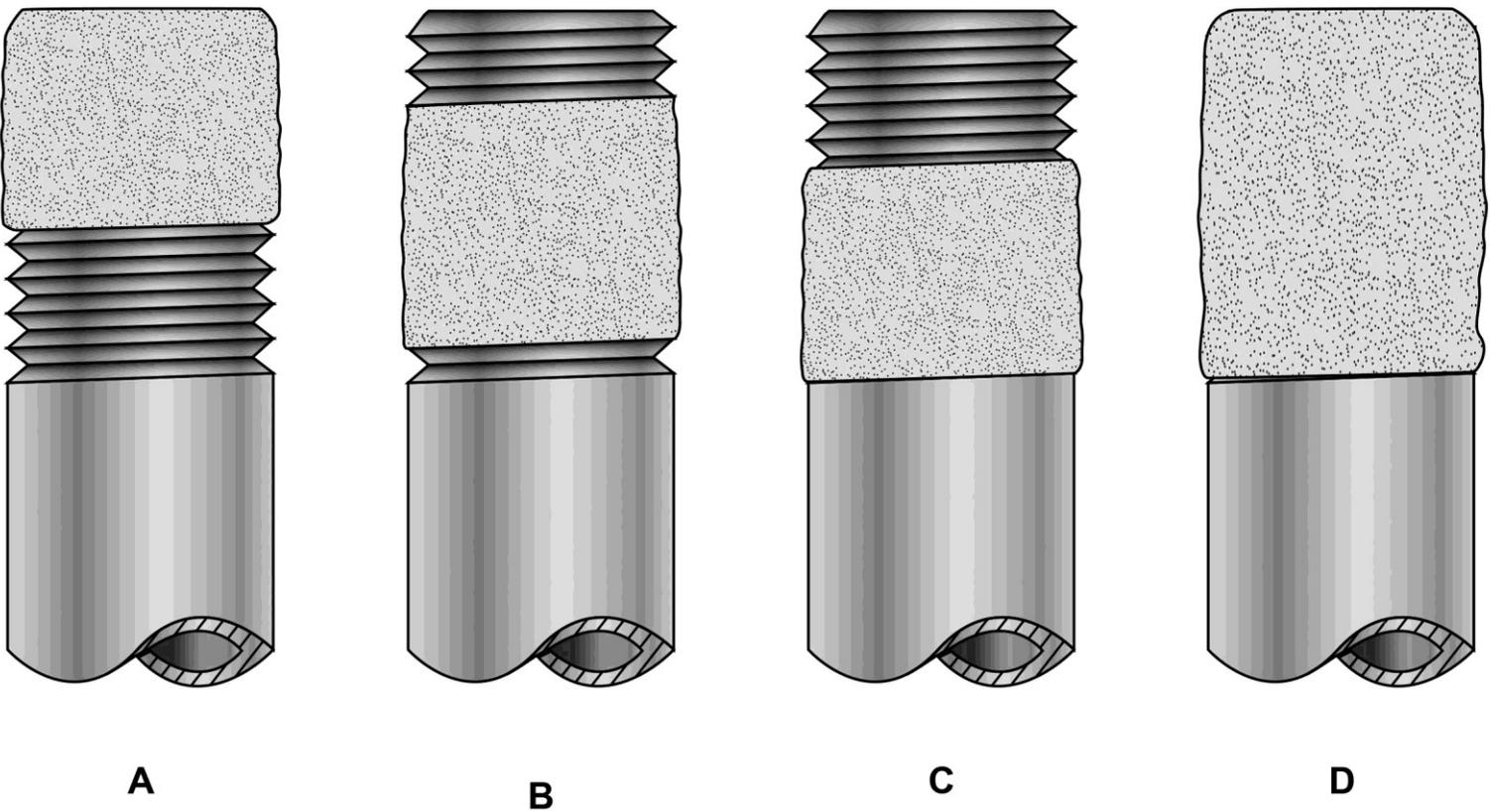
If choice A is selected set score to 1.

70. A large oil fire on the weather deck of a ship can be effectively fought using _____.

- (A) high velocity fog
- (B) foam
- (C) soda acid
- (D) dry chemical

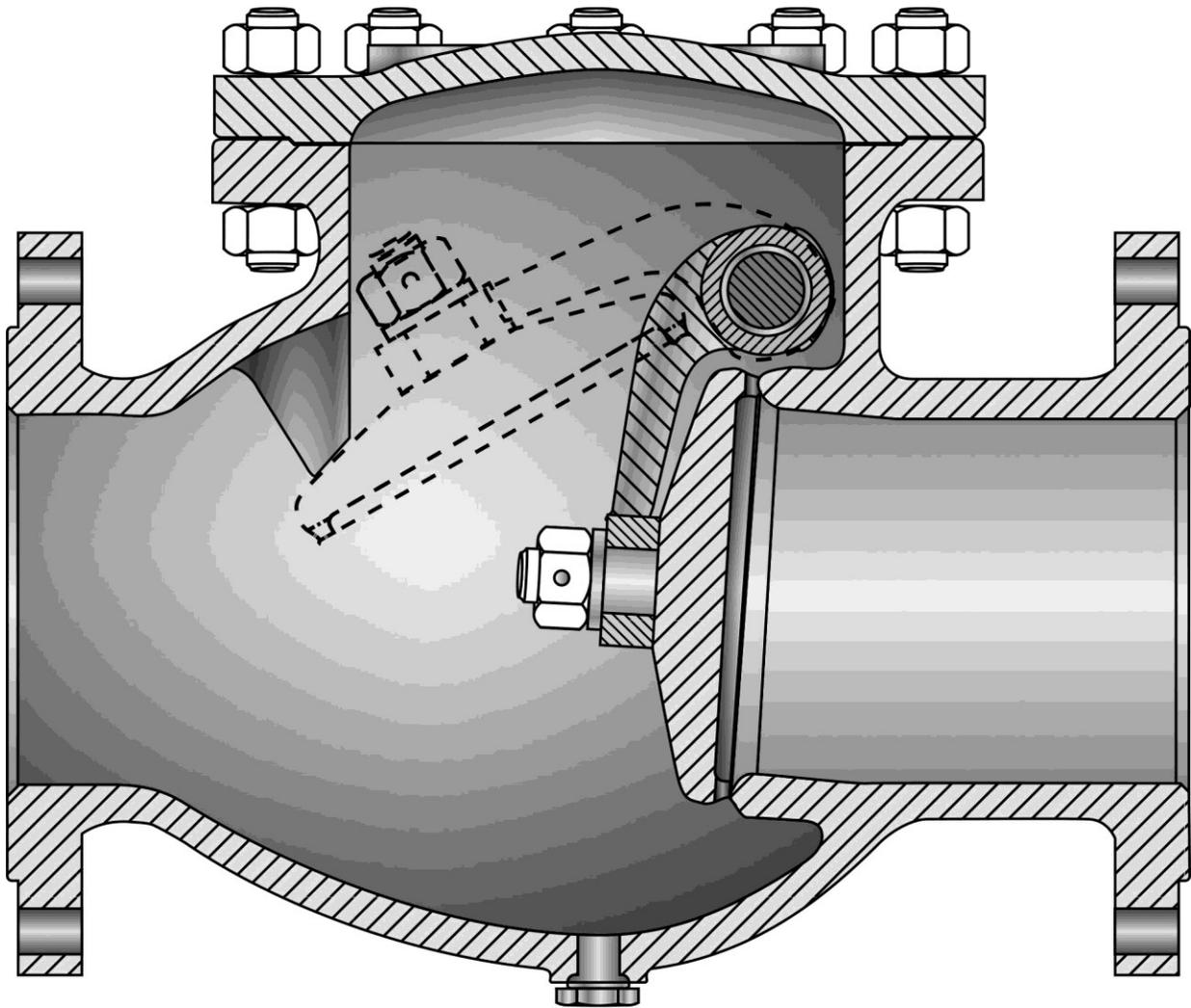
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GS-0046



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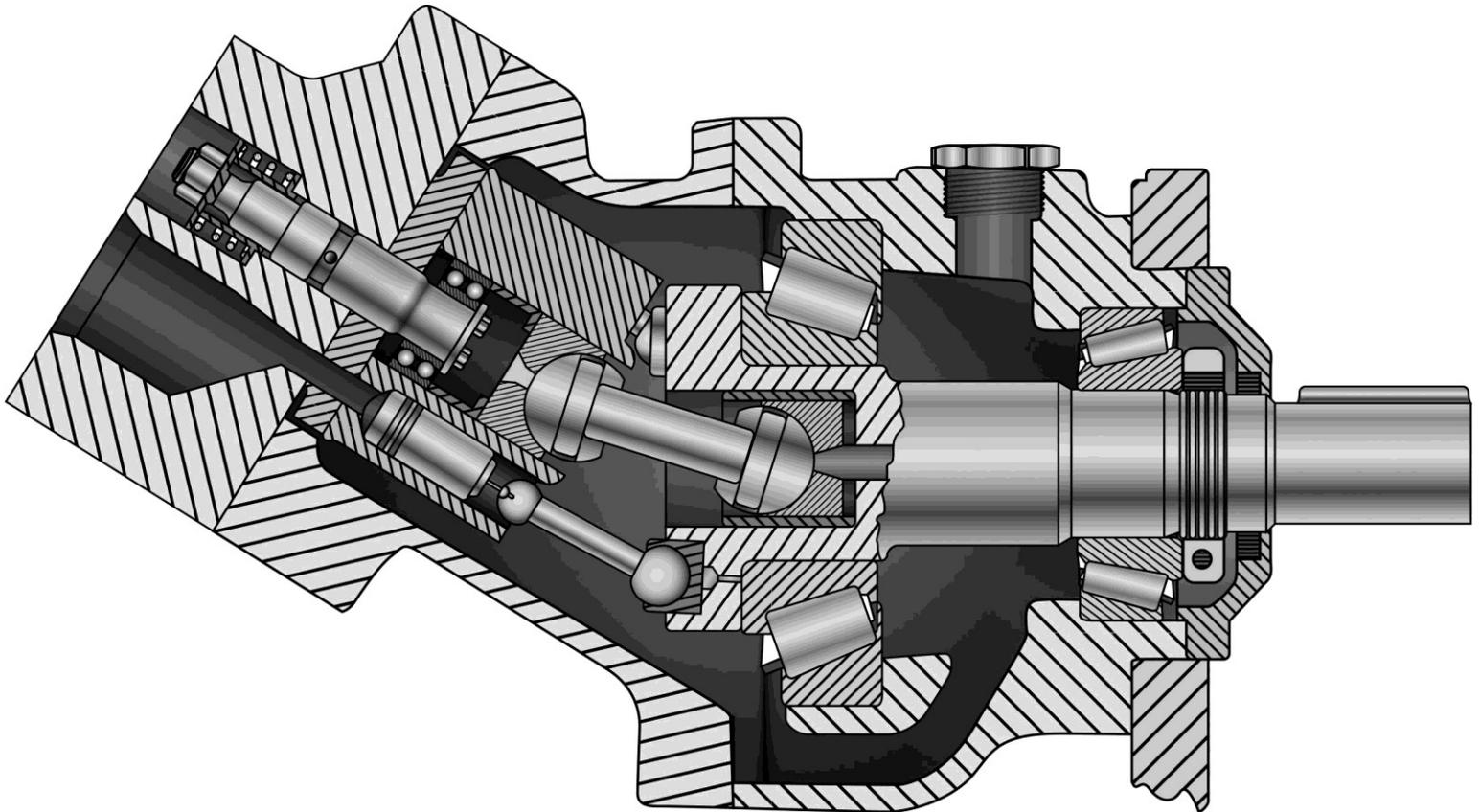
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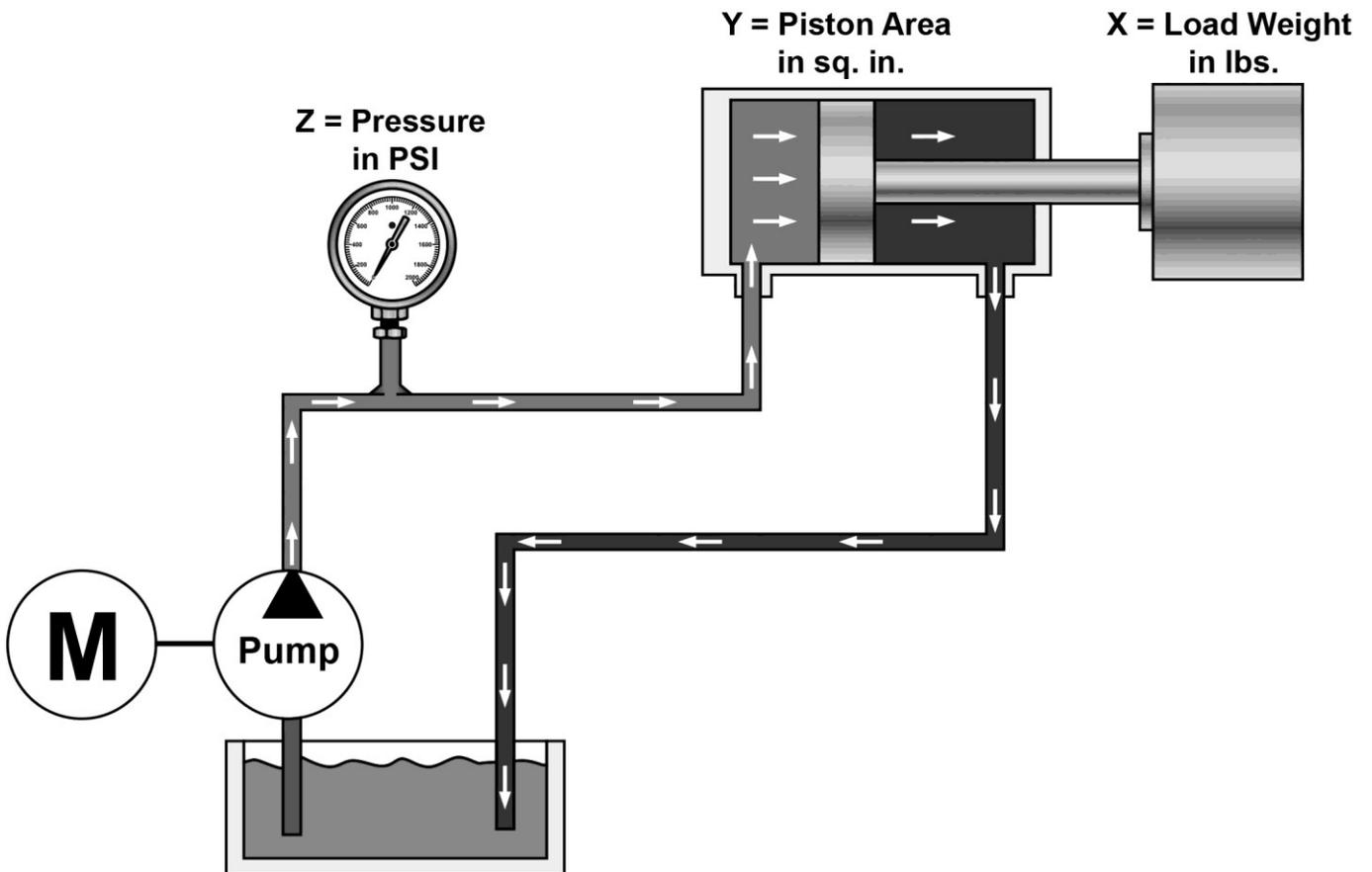
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GS-0058



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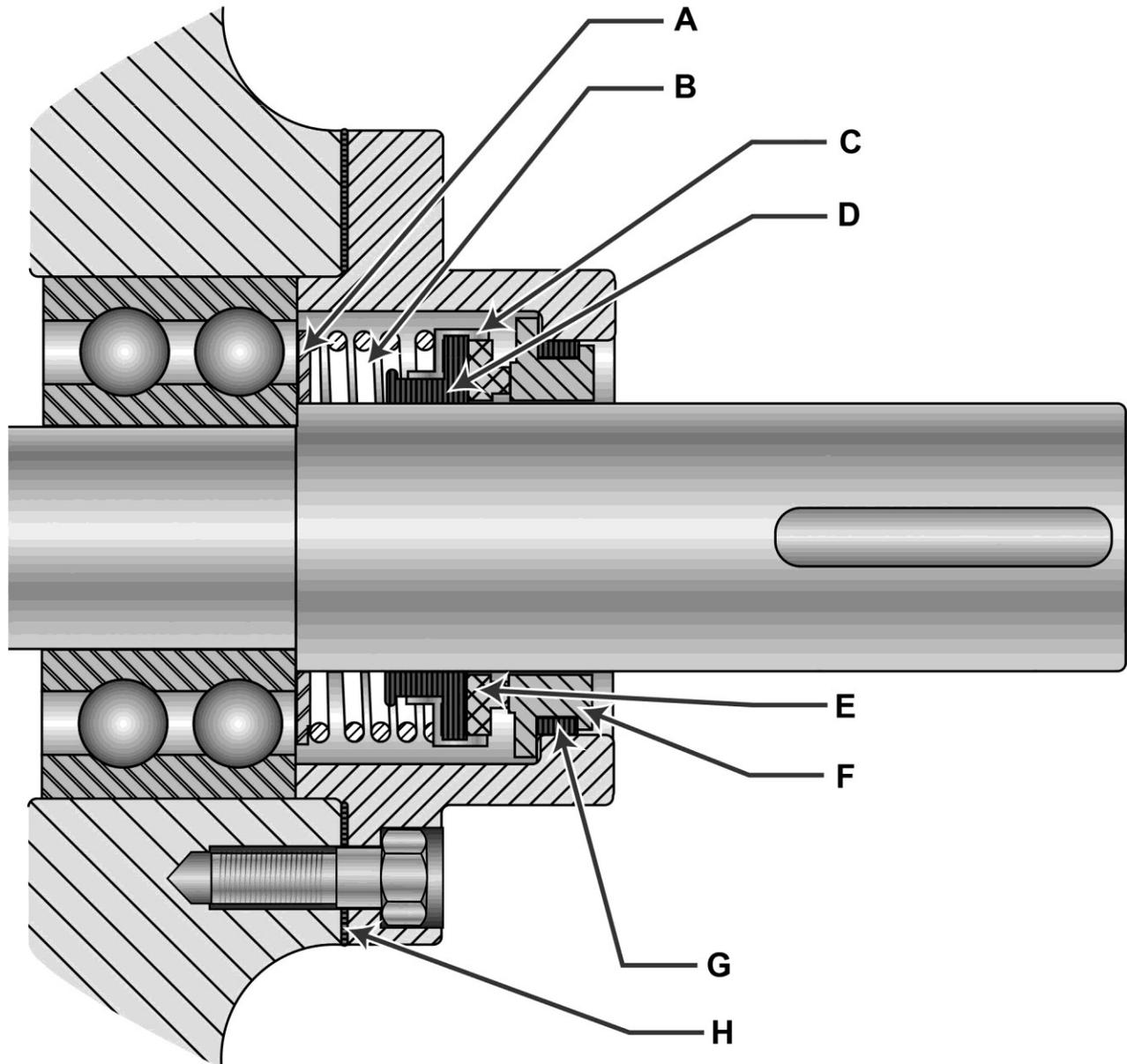


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GS-0071

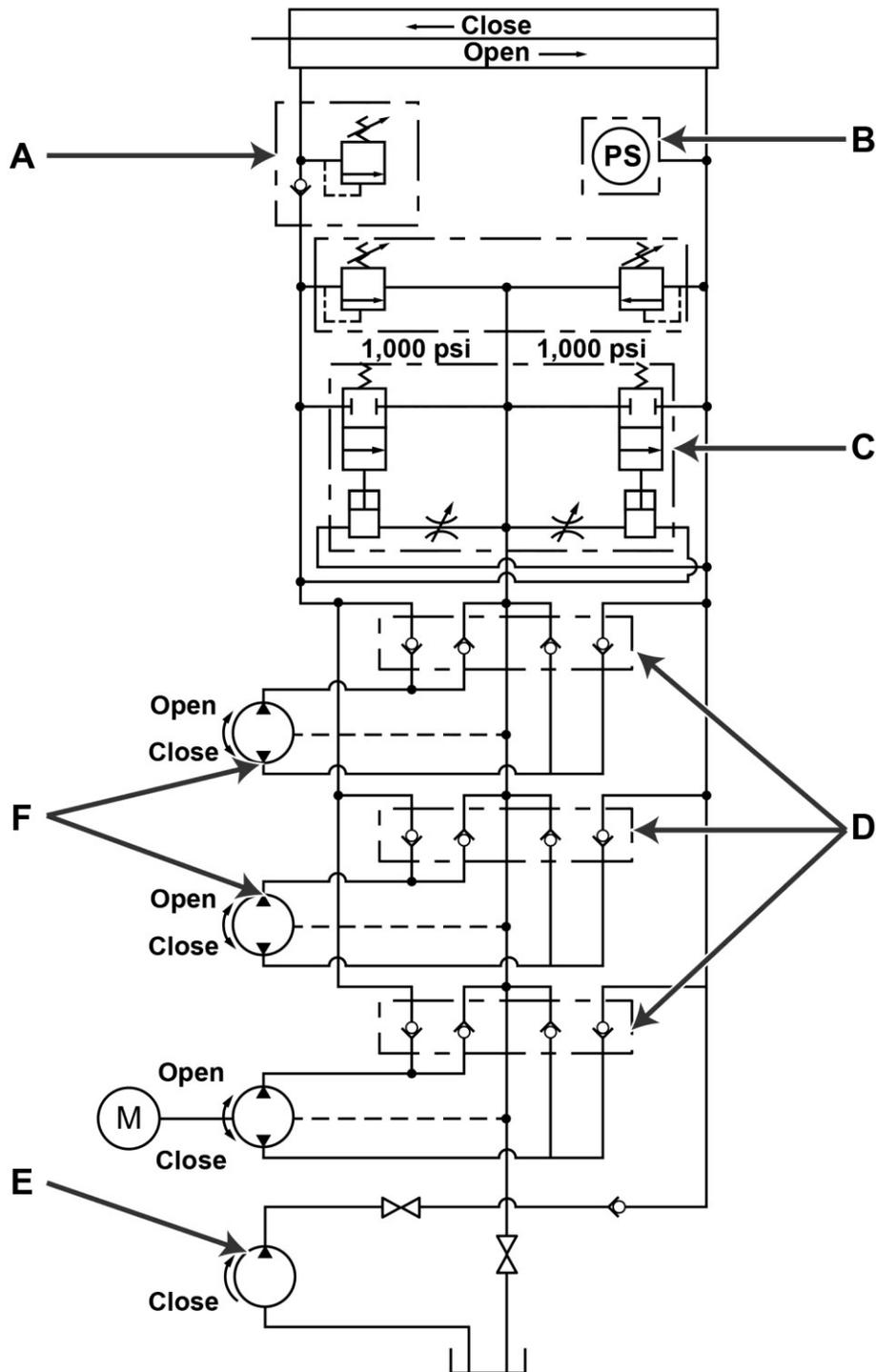


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GS-0103



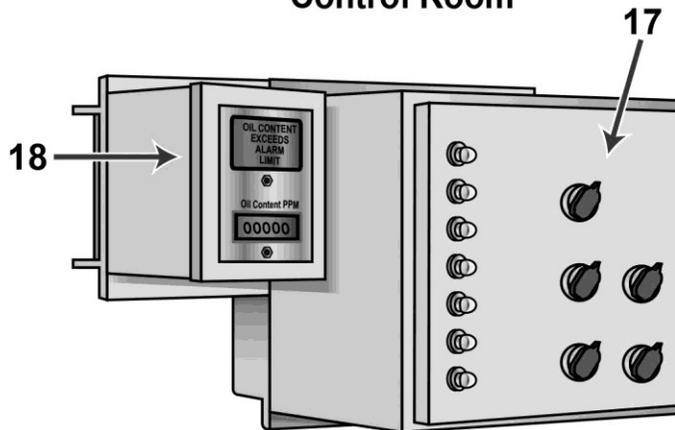
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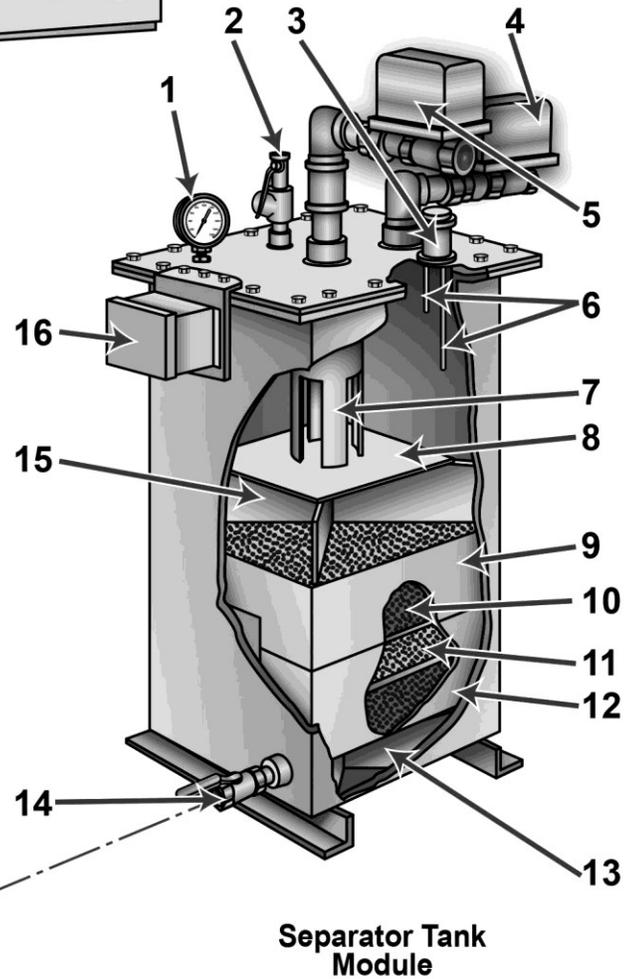
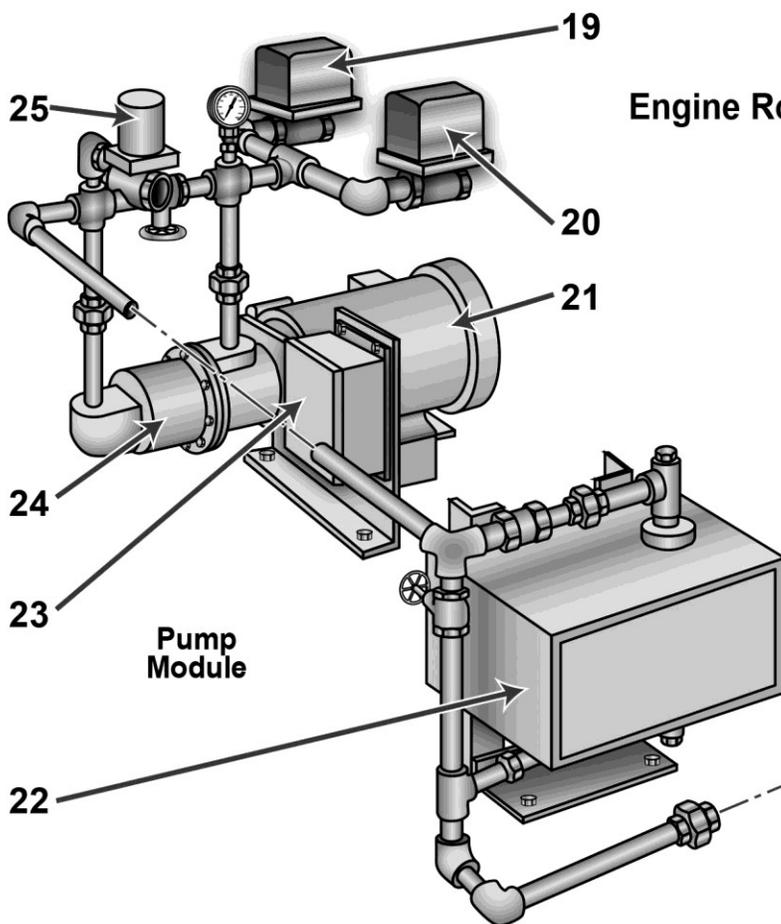
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GS-0153

Control Room

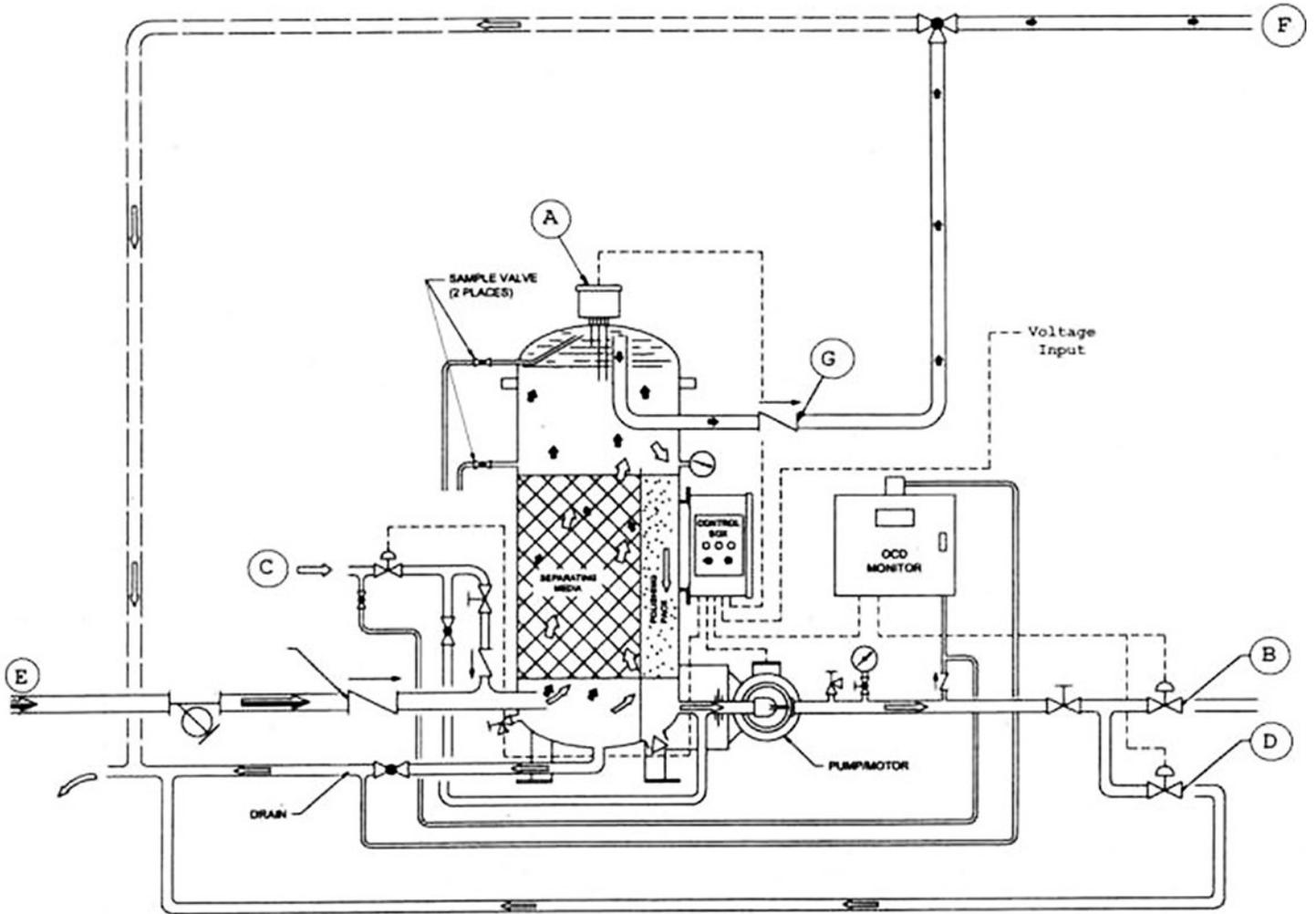


Engine Room



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Including Repair Parts and Special Tools List for Oil Water Separator
TM 55-1925-285-13 & P

GS-0175

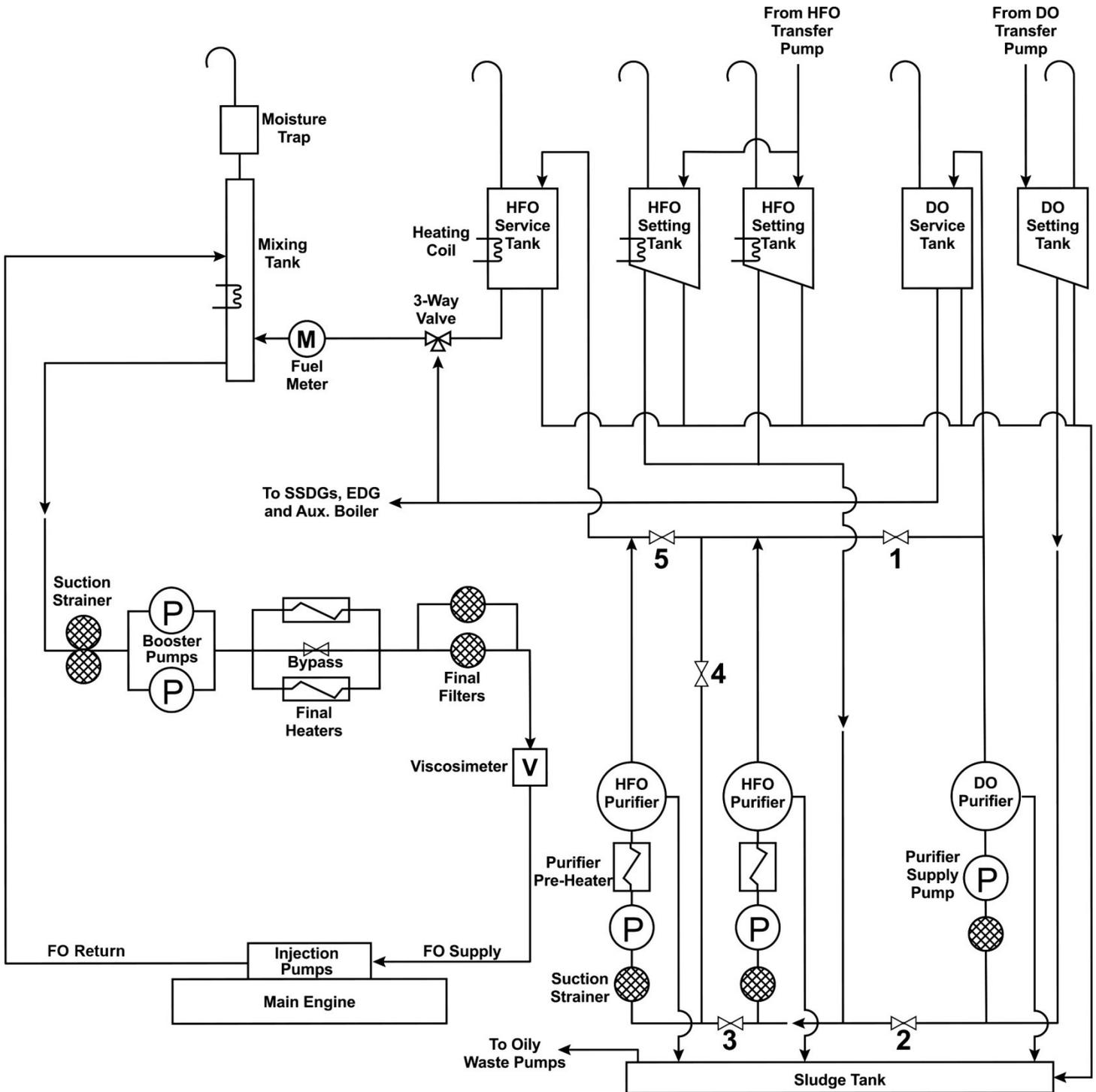


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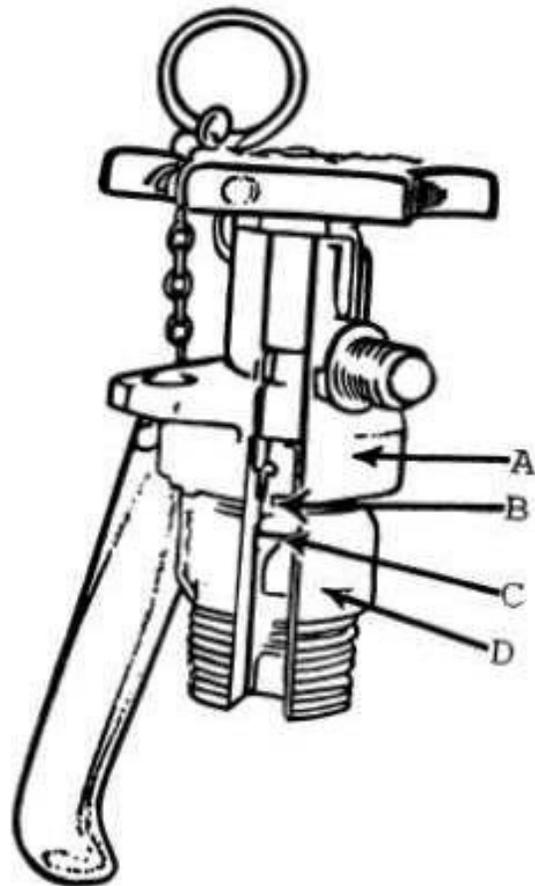
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CG-329