

U.S.C.G. Merchant Marine Exam
Third Assistant Engineer, Unlimited
Q535 General Subjects
(Sample Examination)

Choose the best answer to the following Multiple Choice Questions.

1. How would you prevent the rudder from moving while a repair is made on the steering system using the illustrated actuator? Illustration GS-0116
- (A) secure the valves in the supply and return lines
 - (B) tighten the locking screws in item "S"
 - (C) screw in the locking pin, item "J"
 - (D) tighten the locking pins, item "H" at each position of item "I" to keep the rudder from swinging

If choice A is selected set score to 1.

2. What term is defined as the amount of heat required to convert a unit mass of a substance from a liquid to a vapor at constant temperature and pressure?
- (A) Latent heat of fusion
 - (B) Specific heat of vaporization
 - (C) Sensible heat of vaporization
 - (D) Latent heat of vaporization

If choice D is selected set score to 1.

3. What provisions are generally made to reduce the noise and vibration emanating from the propulsion machinery installation, especially on passenger ships?
- (A) The propulsion machinery is resiliently mounted to machinery beds integral to the double bottom structure, and power is transmitted without use of flexible couplings.
 - (B) The propulsion machinery is rigidly bolted to machinery beds integral to the double bottom structure, and power is transmitted with use of flexible couplings.
 - (C) The propulsion machinery is rigidly bolted to machinery beds integral to the double bottom structure, and power is transmitted without use of flexible couplings.
 - (D) The propulsion machinery is resiliently mounted to machinery beds integral to the double bottom structure, and power is transmitted with use of flexible couplings.

If choice D is selected set score to 1.

4. Which of the following is NOT a function of the water supply through item "P" shown in the illustration? Illustration MO-0110
- (A) It supplies feed water to evaporator.
 - (B) It supplies the operating medium used in the removal of the brine.
 - (C) It supplies the operating medium used in the removal of the distillate.
 - (D) It supplies the operating medium used in the removal of air and non-condensable gases.

If choice C is selected set score to 1.

5. For marine-type shell-and-tube heat exchangers, what is the most common arrangement for baffles?

- (A) Segmental
- (B) Disc
- (C) Doughnut
- (D) Solid

If choice A is selected set score to 1.

6. Suppose the illustrated pneumatically operated, diaphragm actuated control valve is used to control the fuel oil outlet temperature of a steam-heated heavy fuel oil heater by controlling the steam flow. What would be the result if the control diaphragm became ruptured? Illustration GS-0051

- (A) The valve would fail in the fully open position, most likely resulting in a high fuel oil temperature alarm condition.
- (B) The valve would fail in the exact position just before the control diaphragm ruptured. The fuel temperature will fluctuate with changes in fuel demand.
- (C) The valve would fail in the fully closed position, most likely resulting in a low fuel oil temperature alarm condition.
- (D) It is not possible to predict how the valve would respond to a ruptured diaphragm.

If choice A is selected set score to 1.

7. As shown in the illustration, if figure "21" indicates the "TOP VIEW" of an orthographic projection, and figure "11" indicates the "FRONT VIEW", which figure would best represent the correct "RIGHT SIDE VIEW"? Illustration GS-0165

- (A) Figure "2"
- (B) Figure "8"
- (C) Figure "10"
- (D) Figure "15"

If choice C is selected set score to 1.

8. What is the distance between the center of the discharge outlet and the top of the motor illustrated? Illustration GS-0011

- (A) 34 5/8 inches
- (B) 35 inches
- (C) 35 5/8 inches
- (D) 36 inches

If choice D is selected set score to 1.

- 9.** What is the physical state and pressure condition of refrigerant as it enters the condenser of a typical refrigeration system?
- (A) low-pressure vapor
 - (B) low-pressure liquid
 - (C) high-pressure vapor
 - (D) high-pressure liquid

If choice C is selected set score to 1.

- 10.** When checking the oil level on a reciprocating air compressor fitted with a dipstick, under what conditions should the oil level be checked?
- (A) With the compressor running at speed and unloaded.
 - (B) With the compressor running at speed and loaded.
 - (C) With the compressor in the auto mode and currently not running.
 - (D) With the compressor in the off mode incapable of starting.

If choice D is selected set score to 1.

- 11.** Capacity control of a centrifugal refrigeration compressor can be accomplished by what means?
- (A) varying the position of the hot gas bypass valve
 - (B) varying the speed of the compressor
 - (C) varying the position of the suction inlet damper vanes
 - (D) all of the above

If choice D is selected set score to 1.

- 12.** Which of the listed types of bearings is an example of a half bearing?
- (A) Piston pin bushing
 - (B) Spring bearing
 - (C) Thrust bearing
 - (D) All of the above.

If choice B is selected set score to 1.

- 13.** What type of propeller consists of a flat disc set flush with the under surface of the vessel's hull with a number of vertical, rudder-like blades projecting from it?
- (A) Contra-rotating propeller
 - (B) Tandem propeller
 - (C) Helicoidal propeller
 - (D) Cycloidal propeller

If choice D is selected set score to 1.

14. Which of the following bilge pumping applications would most likely use a non-automated centrifugal pump under manual supervision?

- (A) Shaft alley bilges
- (B) Machinery space bilges
- (C) Engine room bilges
- (D) Dry cargo-hold bilges

If choice D is selected set score to 1.

15. Excessive air leakage into the suction side of a centrifugal pump would be indicated by which of the following operational problems?

- (A) The motor over current protective device continually shuts the pump down.
- (B) The pump packing gland overheats after short operating periods.
- (C) The pump delivers full capacity when started, but gradually slackens off to an abnormally low flow.
- (D) Pounding noises can be heard at the pump suction chest.

If choice C is selected set score to 1.

16. Which of the following illustrated expansion valves is designed to maintain a constant evaporator pressure rather than a constant evaporator superheat? Illustration GS-RA-24

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

If choice C is selected set score to 1.

17. Traditionally, which of the listed refrigerants has been more suitable than the others for use in a centrifugal refrigeration compressor?

- (A) R-11
- (B) R-12
- (C) Ammonia
- (D) Carbon dioxide

If choice A is selected set score to 1.

18. As shown in figure "B" of the illustrated self-contained recovery unit connection diagrams, what is the recovery method supported by the connection scheme? Illustration GS-RA-33

- (A) direct vapor recovery
- (B) direct liquid recovery
- (C) liquid recovery/push-pull
- (D) vapor recovery/push-pull

If choice A is selected set score to 1.

19. Regarding a reverse osmosis type fresh water generator using multiple spiral-wound membrane modules, what statement is true?

- (A) Modules may be piped in series to increase the fresh water throughput.
- (B) Modules may be piped in series to increase the fresh water purity.
- (C) Modules may be piped in parallel to increase the fresh water purity.
- (D) Modules may be piped in series to decrease the likelihood of fouling.

If choice B is selected set score to 1.

20. If a micrometer were opened to a distance of 0.0001 inch, you would say the reading is _____.

- (A) one millionth of an inch
- (B) ten millionths of an inch
- (C) one ten thousandth of an inch
- (D) ten one thousandths of an inch

If choice C is selected set score to 1.

21. In the presence of an open flame or hot surfaces, chlorinated fluorocarbon refrigerants decompose and form what chemical substance?

- (A) phosgene gas
- (B) carbon monoxide
- (C) water vapor
- (D) petroleum crystals

If choice A is selected set score to 1.

22. Overfilling a refrigerant container is extremely dangerous because of the high pressures generated. The generation of pressure is the result of what?

- (A) discharge pressure from the recovery cylinder
- (B) vapor pressure of the refrigerant at saturation temperature
- (C) discharge pressure of the recovery compressor
- (D) hydrostatic pressure of the expanding liquid

If choice D is selected set score to 1.

23. What advantage does a 4-pipe hydronic heating/cooling system have over a 2-pipe hydronic heating/cooling system?

- (A) A 4-pipe hydronic heating/cooling system can serve twice as many zones as a 2-pipe hydronic heating/cooling system.
- (B) A 4-pipe hydronic heating/cooling system requires double the amount of piping as compared to a 2-pipe hydronic heating/cooling system serving the same number of zones.
- (C) A 4-pipe hydronic heating/cooling system allows simultaneous heating and cooling of different zones, whereas a 2-pipe hydronic heating/cooling system does not.
- (D) A 4-pipe hydronic heating/cooling system requires one-half the amount of piping as compared to a 2-pipe hydronic heating/cooling system serving the same number of zones.

If choice C is selected set score to 1.

24. In a refrigeration system, the bulb for the thermal expansion valve is always located where?

- (A) in the middle of the evaporator coils
- (B) at the evaporator coil inlet
- (C) at the evaporator coil outlet
- (D) at the beginning of the bottom row of the evaporator coils

If choice C is selected set score to 1.

25. On a bearing using an oiling ring as a means of static oil feed, how often should the bottom of the bearing sump be drained of impurities?

- (A) Every round
- (B) Daily
- (C) Bimonthly
- (D) Annually

If choice C is selected set score to 1.

26. A roughened checkered surface is machined by a lathe on round stock using a _____.

- (A) checkering tool
- (B) threading tool
- (C) chamfering tool
- (D) knurling tool

If choice D is selected set score to 1.

27. In which lubrication application is a lubricating oil with an alkaline reserve most likely to be used?

- (A) Trunk type diesel engine lubricating oil.
- (B) Stern tube bearing lubricating oil.
- (C) Steam turbine lubricating oil.
- (D) Crosshead diesel engine bearing lubricating oil.

If choice A is selected set score to 1.

28. A hydraulic fluid flow control circuit, controlling linear actuator speed during extension, with the pump operating at system pressure, is known as a _____.

- (A) metered-out circuit
- (B) metered-in circuit
- (C) bleed-in circuit
- (D) bleed-off circuit

If choice B is selected set score to 1.

29. Where is the latent heat obtained to create vapor from the feed water in the illustrated distiller?
Illustration MO-0111

- (A) During its contact period with heat exchanger "3".
- (B) Only as it passes through device "20".
- (C) From having passed through "23".
- (D) While it is in contact with device "24".

If choice C is selected set score to 1.

30. Which of the following guidelines is considered to reflect good design practices for shipboard steam heating systems?

- (A) Provide a dirt pocket and strainer ahead of the steam trap on a unit heater return.
- (B) Provide all units with a dirt trap and gate valve in the supply and a check valve on the return.
- (C) Wherever possible install vertical runs for condensate piping.
- (D) Provide orifice-type bypasses for all traps and automatic valves.

If choice A is selected set score to 1.

- 31.** As shown in figure "A" of the illustrated block diagram of a central operating system configured for direct digital control, what does the output system block "ANALOG D/A" represent? Illustration EL-0095
- (A) It receives analog outputs from the CPU and converts these to digital signals for transmission to the digital actuators.
 - (B) It receives analog outputs from the CPU and conditions these to analog signals for transmission to the analog actuators.
 - (C) It receives digital outputs from the CPU and converts these to analog signals for transmission to the analog actuators.
 - (D) It receives digital outputs from the CPU and conditions these to digital signals for transmission to the digital actuators.

If choice C is selected set score to 1.

- 32.** For a pneumatic transmission system for instrumentation and control purposes, what is a common industry standard for pneumatic signal pressure range?
- (A) 0 to 10 psig
 - (B) 0 to 100 psig
 - (C) 3 to 15 psig
 - (D) 3 to 150 psig

If choice C is selected set score to 1.

- 33.** Referring to the illustration, note that the solenoid in line "C" is closed. The check valve in line "E" is open. The separator service pump is running. The check valve in line "G" is closed. Valve "B" is closed. Valve "D" is open. What is the operational status of the oily-water separator unit? Illustration GS-0175
- (A) The oily-water separator is in the bilge water separation processing mode with water discharging back to the bilge water holding tank with an oil content greater than 15 ppm.
 - (B) The oily-water separator is in the bilge water separation processing mode with water discharging back to the bilge water holding tank with an oil content less than 15 ppm.
 - (C) The oily-water separator is in the bilge water separation processing mode with water discharging overboard with an oil content less than 15 ppm.
 - (D) The oily-water separator is in the bilge water separation processing mode with water discharging overboard with an oil content greater than 15 ppm.

If choice A is selected set score to 1.

- 34.** After coolers are used with air compressors to _____.
- (A) dampen pressure pulses in the discharge air
 - (B) ensure complete expansion of the compressed air
 - (C) decrease the density of compressed air
 - (D) reduce the temperature of compressed air

If choice D is selected set score to 1.

35. Concerning the charging of refrigerant into a vapor compression refrigerating system, which of the following is true?

- (A) when charging as a liquid it should be to the high side only
- (B) when charging as a liquid it should be to the low side only
- (C) when charging as a vapor it should be directly to the receiver only
- (D) when charging as a liquid it may be to the low or high side

If choice A is selected set score to 1.

36. In the illustrated self-contained, internal-pilot, piston-operated temperature control valve, what statement is true concerning the pilot and main valves? Illustration GS-0045

- (A) The pilot valve is downward seating and the main valve is upward seating.
- (B) The pilot valve is upward seating and the main valve is upward seating.
- (C) The pilot valve is downward seating and the main valve is downward seating.
- (D) The pilot valve is upward seating and the main valve is downward seating.

If choice B is selected set score to 1.

37. Which term represents the change in speed required before a speed control governor will initiate corrective action as the load changes?

- (A) Promptness
- (B) Power
- (C) Sensitivity
- (D) Dead band

If choice D is selected set score to 1.

38. What type of temperature transmitter would be most suitable for measuring running gear bearing temperatures in a diesel engine in that it requires no contact with the bearing?

- (A) Thermistor probe
- (B) Radiation pyrometer
- (C) Resistance temperature detector
- (D) Thermocouple pyrometer

If choice B is selected set score to 1.

39. The carbon seal ring of a refrigeration compressor crankshaft mechanical seal is held in position against the stationary ring face by using what device?

- (A) snap ring
- (B) woodruff key
- (C) spring
- (D) thrust washer

If choice C is selected set score to 1.

- 40.** What provision is made for sea chests for removal of ice from within the sea chest of a machinery space sea water cooling system during operation in icy waters?
- (A) The ice may be removed by using the chemical de-icing antifreeze connection, if provided.
 - (B) The ice may be removed by using the fire main flushing connection, if provided.
 - (C) The ice may be removed by using the steaming out sea chest blow connection, if provided.
 - (D) The ice may be removed by using the compressed air sea chest blow connection, if provided.

If choice C is selected set score to 1.

- 41.** What type of pump is shown in the illustration? Illustration GS-0144
- (A) Deep well centrifugal pump
 - (B) Simplex reciprocating pump
 - (C) Triple screw rotary pump
 - (D) Double screw rotary pump

If choice C is selected set score to 1.

- 42.** When accomplishing welding repairs using the electric arc welding process, what statement is true concerning the characteristics of a good quality weld when welding a single-V butt joint?
- (A) There should be no penetration at the sides of the weld, and there should be no penetration between passes.
 - (B) There should be no penetration at the sides of the weld, but there should be penetration between passes.
 - (C) There should be penetration at the sides of the weld, and there should be penetration between passes.
 - (D) There should be penetration at the sides of the weld, but there should be no penetration between passes.

If choice C is selected set score to 1.

- 43.** What mode of heat transfer is associated with the transport of thermal energy within a body or between two bodies in direct contact?
- (A) Radiation
 - (B) Conduction
 - (C) Sublimation
 - (D) Convection

If choice B is selected set score to 1.

44. Which of the following statements is true concerning the gauge labeled "A" of the illustrated gauge manifold set? Illustration GS-RA-01

- (A) The gauge labeled "A" is a compound gauge and is usually color-coded blue.
- (B) The gauge labeled "A" is a compound gauge and is usually color-coded red.
- (C) The gauge labeled "A" is a standard pressure gauge and is usually color-coded blue.
- (D) The gauge labeled "A" is a standard pressure gauge and is usually color-coded red.

If choice A is selected set score to 1.

45. Which of the listed reciprocating pump parts control the position of the pilot slide valve?

- (A) Adjusting of the tappet collars
- (B) Movement of the main piston through the steam cylinder
- (C) Moving tappets
- (D) Stay rods

If choice B is selected set score to 1.

46. The device illustrated would be best used as a _____. Illustration GS-0058

- (A) power take-off driven lube oil pump
- (B) variable capacity pump
- (C) hydraulic hatch supply pump
- (D) variable or constant speed motor

If choice D is selected set score to 1.

47. In order to facilitate separation of oil from an oily-water mixture in an oily-water separator, what statement is true concerning the flow pattern of the oily-water?

- (A) Ideally the flow of the oily-water should be low in flow rate and high in turbulence.
- (B) Ideally the flow of the oily-water should be high in flow rate and high in turbulence.
- (C) Ideally the flow of the oily-water should be low in flow rate and low in turbulence.
- (D) Ideally the flow of the oily-water should be high in flow rate and low in turbulence.

If choice C is selected set score to 1.

- 48.** If a reciprocating air compressor has cylinder suction or discharge valves that fail to properly seat, what statement is true concerning the result?
- (A) The compressor would have longer running periods at higher displacement capacity between operating cycles.
 - (B) The compressor would have shorter running periods at lower displacement capacity between operating cycles.
 - (C) The compressor would have shorter running periods at higher displacement capacity between operating cycles.
 - (D) The compressor would have longer running periods at lower displacement capacity between operating cycles.

If choice D is selected set score to 1.

- 49.** With an increase in temperature, the volume of hydraulic fluid _____.
- (A) increases
 - (B) contracts
 - (C) remains constant if pressure decreases
 - (D) remains the same

If choice A is selected set score to 1.

- 50.** The primary function of a centrifugal pump volute is to _____.
- (A) develop a high velocity liquid
 - (B) limit hydraulic end thrust
 - (C) initiate flow
 - (D) convert velocity to pressure

If choice D is selected set score to 1.

- 51.** In accordance with 33 CFR Subchapter O (Pollution), besides retention of ballast water onboard or use of approved onboard ballast water treatment equipment, what is another acceptable means for a vessel to be in compliance with the ballast water management regulations?
- (A) Perform a complete ballast water exchange in an area no less than 3 nautical miles from any shore prior to discharging ballast in U.S. waters.
 - (B) Perform a complete ballast water exchange in an area no less than 12 nautical miles from any shore prior to discharging ballast in U.S. waters.
 - (C) Perform a complete ballast water exchange in an area no less than 25 nautical miles from any shore prior to discharging ballast in U.S. waters.
 - (D) Perform a complete ballast water exchange in an area no less than 200 nautical miles from any shore prior to discharging ballast in U.S. waters.

If choice D is selected set score to 1.

52. For a typical transverse-framed deep-draft commercial vessel, what is the normal arrangement for the support of decks?

- (A) Deck beams are transversely arranged and deck girders are longitudinally arranged and the deck beams are continuous with the exception of hatches and other openings. The deck girders are intercostal.
- (B) Deck beams are transversely arranged and deck girders are longitudinally arranged and both are continuous with the exception of hatches and other openings.
- (C) Deck beams are transversely arranged and deck girders are longitudinally arranged and the deck girders are continuous with the exception of hatches and other openings. The deck beams are intercostal.
- (D) Deck beams are longitudinally arranged and deck girders are transversely arranged and both are continuous with the exception of hatches and other openings.

If choice B is selected set score to 1.

53. With regard to the cooling and heating coils and humidification and regeneration chambers of a liquid cargo-hold dehumidification system, which statement is true?

- (A) The chamber that processes the cargo-hold air contains the cooling coil and is known as the humidification chamber. The chamber that processes the outside air contains the heating coil and is known as the regeneration chamber.
- (B) The chamber that processes the outside air contains the cooling coil and is known as the humidification chamber. The chamber that processes the cargo-hold air contains the heating coil and is known as the regeneration chamber.
- (C) The chamber that processes the cargo-hold air contains the heating coil and is known as the humidification chamber. The chamber that processes the outside air contains the cooling coil and is known as the regeneration chamber.
- (D) The chamber that processes the cargo-hold air contains the cooling coil and is known as the regeneration chamber. The chamber that processes the outside air contains the heating coil and is known as the humidification chamber.

If choice A is selected set score to 1.

54. Referring to the illustrated motor ship fresh water cooling system drawing, what statement is true concerning the evaporator? Illustration MP-CW-06

- (A) The evaporator uses heat recovered from the main engine cooling water as a heat source to generate fresh water and is piped in series with and after the jacket water cooler.
- (B) The evaporator uses heat recovered from the jacket water cooler sea water as a heat source to generate fresh water and is piped in series with and prior to the jacket water cooler.
- (C) The evaporator uses heat recovered from the main engine cooling water as a heat source to generate fresh water and is piped in series with and prior to the jacket water cooler.
- (D) The evaporator uses heat recovered from the main engine cooling water as a heat source to generate fresh water and is piped in parallel with the jacket water cooler.

If choice C is selected set score to 1.

55. In general, the thermal bulb for a thermal expansion valve used in a reciprocating air conditioning system is usually charged with what substance?

- (A) bees wax
- (B) the same refrigerant as the system
- (C) mercuric sulfate
- (D) distilled water

If choice B is selected set score to 1.

56. Why are removable sleeves installed on centrifugal pump shafts?

- (A) They can be removed when it is necessary to lighten the weight of the pump.
- (B) They can be economically replaced as they wear out.
- (C) They increase the strength of the shaft.
- (D) They make it easier to replace the pump shaft packing.

If choice B is selected set score to 1.

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

If choice C is selected set score to 1.

58. The blade for a power hacksaw should be installed with the teeth _____.

- (A) pointing away from the motor end of the machine
- (B) pointing toward the motor end of the machine
- (C) pointing either toward or away from the motor end of the machine
- (D) pointing toward the motor if using a 4 or 6 tooth blade and away from the motor if using a 10 or 14 tooth blade

If choice B is selected set score to 1.

59. The rudder torque capacity of the four ram steering gear illustrated is rated at 44,210,000 inch-pounds with one power unit in operation. If the four ram system was able to be operated as a two ram system with both power units on line, what would be the available torque? Illustration GS-0067

- (A) 11,052,500 inch-pounds
- (B) 22,105,000 inch-pounds
- (C) 44,210,000 inch-pounds
- (D) 88,420,000 inch-pounds

If choice B is selected set score to 1.

60. Which of the following is true concerning the class "D" air conditioning system shown in the following illustration? Illustration GS-RA-42

- (A) The heat load will increase by increasing the amount of recirculated air.
- (B) The room thermostat controls the wet bulb temperature of the air conditioned space.
- (C) System cooling is the direct result of the vapor compression refrigerant circuit of a direct type air conditioning unit.
- (D) The duct thermostat determines the amount of water flow circulating through the cooling coil.

If choice D is selected set score to 1.

61. What statement is true concerning the keel arrangements of a double bottomed ship?

- (A) A ship with a "duct keel" has a single continuous transverse girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with an "I-section keel" has two continuous transverse girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.
- (B) A ship with an "I-section keel" has a single continuous transverse girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with a "duct keel" has two continuous transverse girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.
- (C) A ship with a "duct keel" has a single continuous longitudinal girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with an "I-section keel" has two continuous longitudinal girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.
- (D) A ship with an "I-section keel" has a single continuous longitudinal girder positioned along the centerline and perpendicular to the flat plate keel, and a ship with a "duct keel" has two continuous longitudinal girders spaced apart and positioned on either side of the centerline and perpendicular to the flat plate keel.

If choice D is selected set score to 1.

62. Concerning a conventional mooring winch, what statement is true?

- (A) A high capacity brake is required to hold a load equal to the breaking strength of the mooring line. For reasons of safety, no slippage of the brake is permitted.
- (B) A high capacity brake is required to hold a load exceeding the breaking strength of the mooring line. For reasons of safety, no slippage of the brake is permitted.
- (C) A high capacity brake is required to hold a load approaching the breaking strength of the mooring line, but it is required to slip at a lower tension to avoid mooring line breakage.
- (D) A low capacity brake is required to hold a load far below the breaking strength of the mooring line, but it is required to slip at a lower tension to avoid mooring line breakage.

If choice C is selected set score to 1.

63. What is meant by the term toughness as it applies to a material?

- (A) The ability to resist penetration.
- (B) The ability to resist repeated application and release of force.
- (C) The ability to resist continuous tension.
- (D) The ability to resist continuous compression.

If choice B is selected set score to 1.

64. In accordance with international MARPOL Annex V regulations and federal regulations under 33 CFR Subchapter O (Pollution), the discharge of what category of garbage is prohibited in any waters?

- (A) Ground paper products, rags, glass, metal, bottles, and crockery.
- (B) Ungrounded paper products, rags, glass, metal, bottles, and crockery.
- (C) Floating dunnage, lining, or packing material.
- (D) Plastic or garbage mixed with plastic.

If choice D is selected set score to 1.

65. A roller bearing has an interference fit with the shaft upon which it is being installed. What thermal method of mounting the bearing would be most appropriate?

- (A) Heating the bearing in an oil-bath bearing heater.
- (B) Cooling the bearing with dry ice.
- (C) Cooling the shaft with liquid refrigerant.
- (D) Heating the bearing with an oxyacetylene torch.

If choice A is selected set score to 1.

66. The determining factor for the strength of a flexible rubber hydraulic hose is the _____.

- (A) Teflon sleeve
- (B) braided layer
- (C) synthetic rubber inner tube
- (D) external cover

If choice B is selected set score to 1.

67. Which of the fresh water generators listed below requires a source of heat and evaporates sea water at a location other than a heat exchanger surface?

- (A) Submerged tube type
- (B) Reverse osmosis type
- (C) Titanium plate type
- (D) Flash type

If choice D is selected set score to 1.

68. When using a micrometer to measure a drill for size, you should measure across the drill _____.

- (A) shank
- (B) flutes
- (C) margins
- (D) web

If choice C is selected set score to 1.

69. A vessel is in compliance with federal regulations regarding the discharge of sewage by _____.

- (A) pumping the sewage ashore to an approved container
- (B) holding all sewage onboard
- (C) treating sewage in an approved system
- (D) all of the above

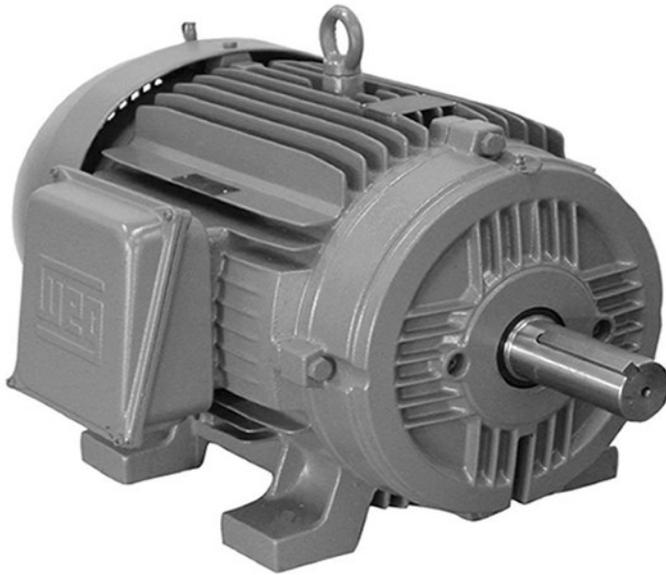
If choice D is selected set score to 1.

70. If a heat exchanger is designed to cool lubricating oil using sea water as a cooling medium, what statement is true?

- (A) The lubricating oil loses sensible heat, and the sea water loses sensible heat.
- (B) The lubricating oil loses sensible heat, and the sea water gains sensible heat.
- (C) The lubricating oil loses latent heat, and the sea water gains latent heat.
- (D) The lubricating oil gains sensible heat and the sea water loses sensible heat.

If choice B is selected set score to 1.

EL-0001



A



B



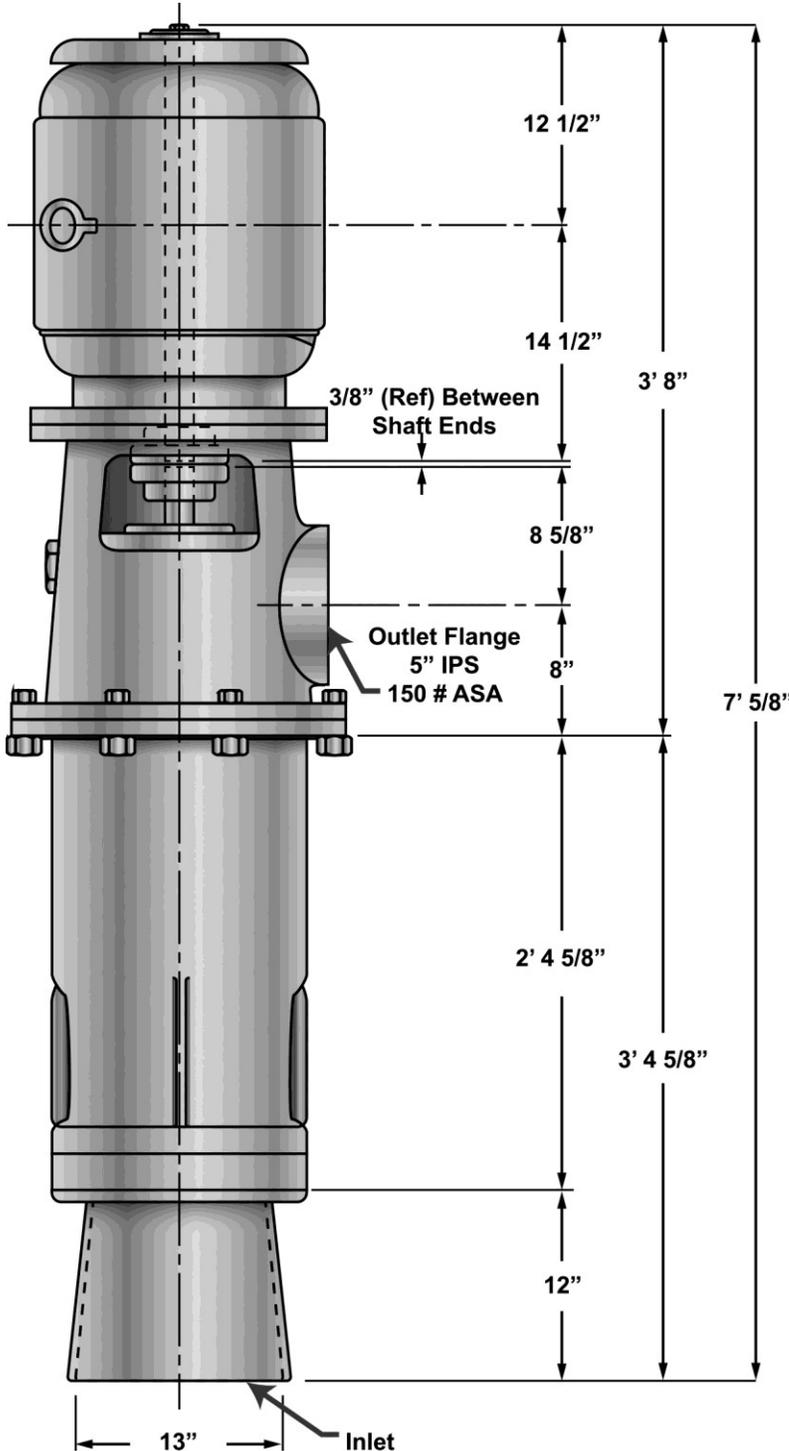
C



D

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GS-0011



MOTOR CHARACTERISTICS

Motor (A. C.)	Electro Dynamic
Rating H. P.	25
Speed R. P. M. (SYN.)	1200
Frame	365 VY
Type	TN
Volts	440
Cycles	60
Phase	3

PUMP CHARACTERISTICS

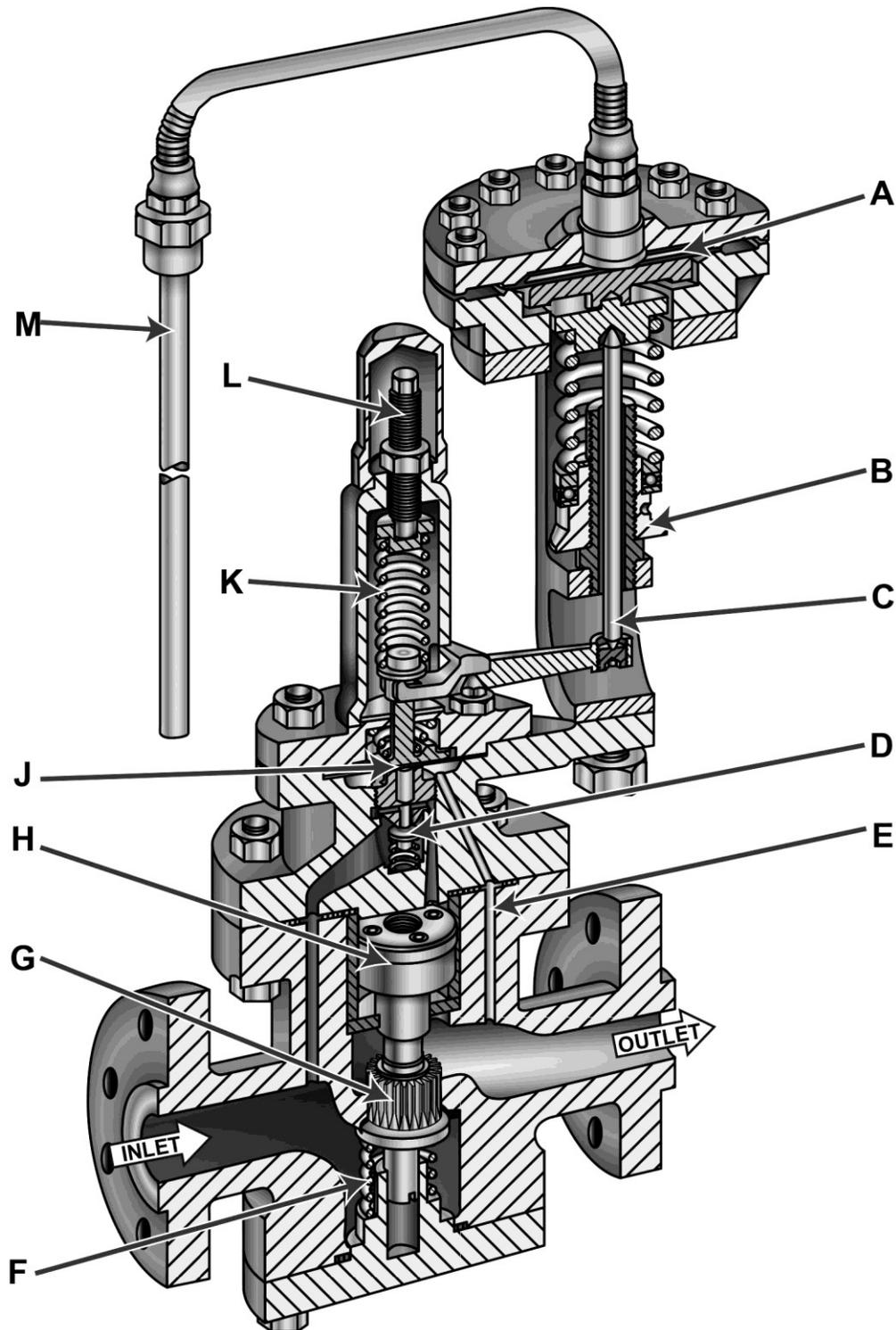
Capacity G. P. M.	400
Speed R. P. M.	1150
Suction Lift "HG	10
B, H, P. @ 1200 SSU-75° F	24.9
Oil viscosity Range, SSU	74-7000
Viscosity Normal SSU @ 140° F	155
Discharge Normal PSIG	55
Fluid Handled, Lube Oil	2190 TEP.
Navy Specification	MIL-L-17331
Oil Temperature Range ° F	40-180

Illustration scale: 1" = 1'

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GS-0045

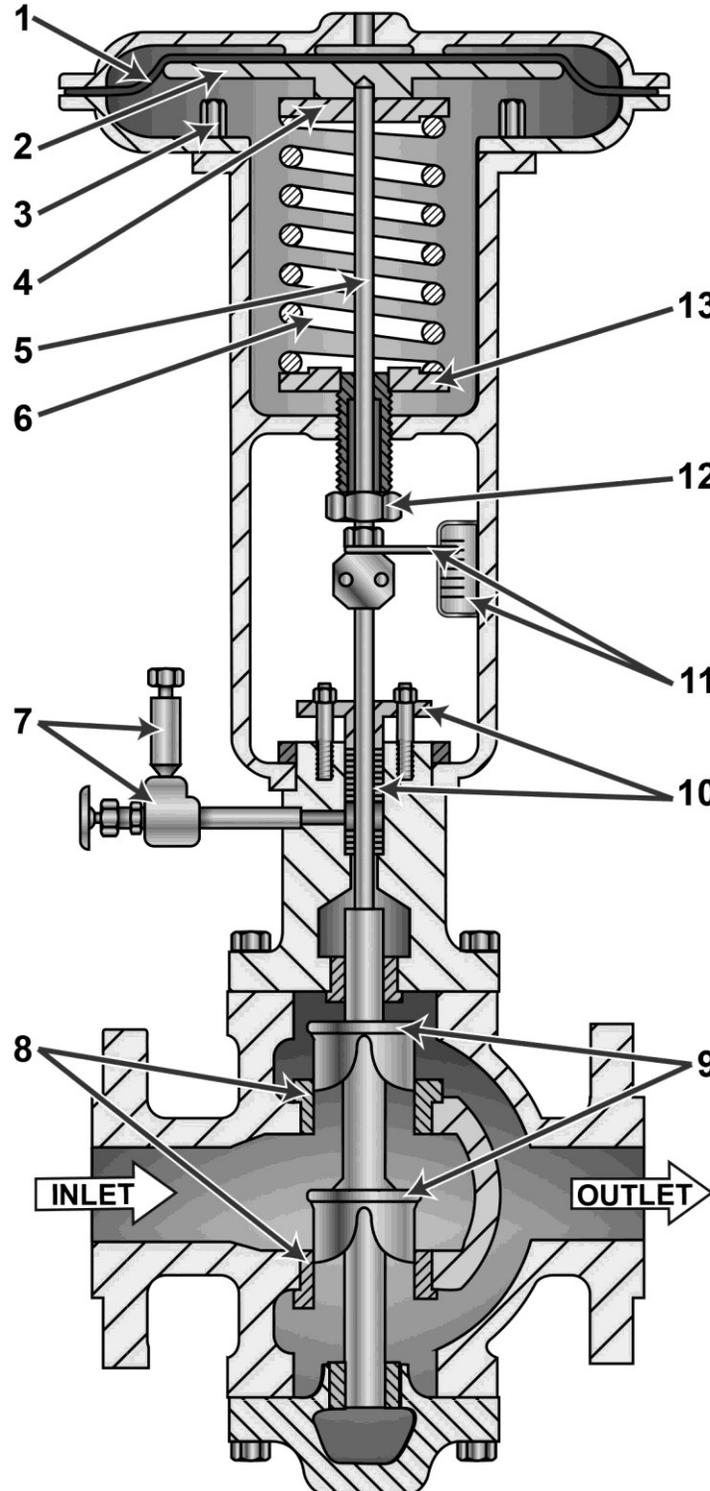


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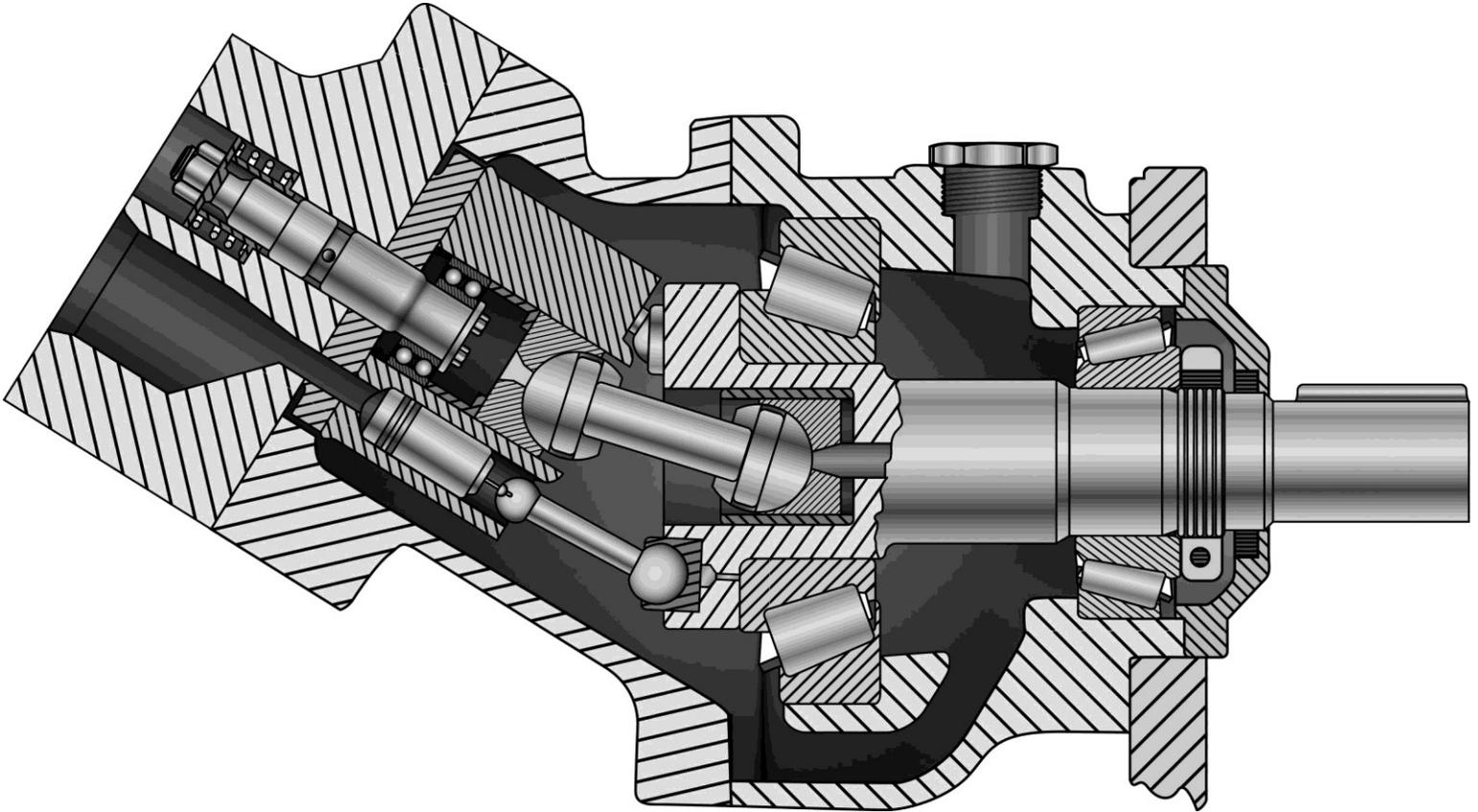


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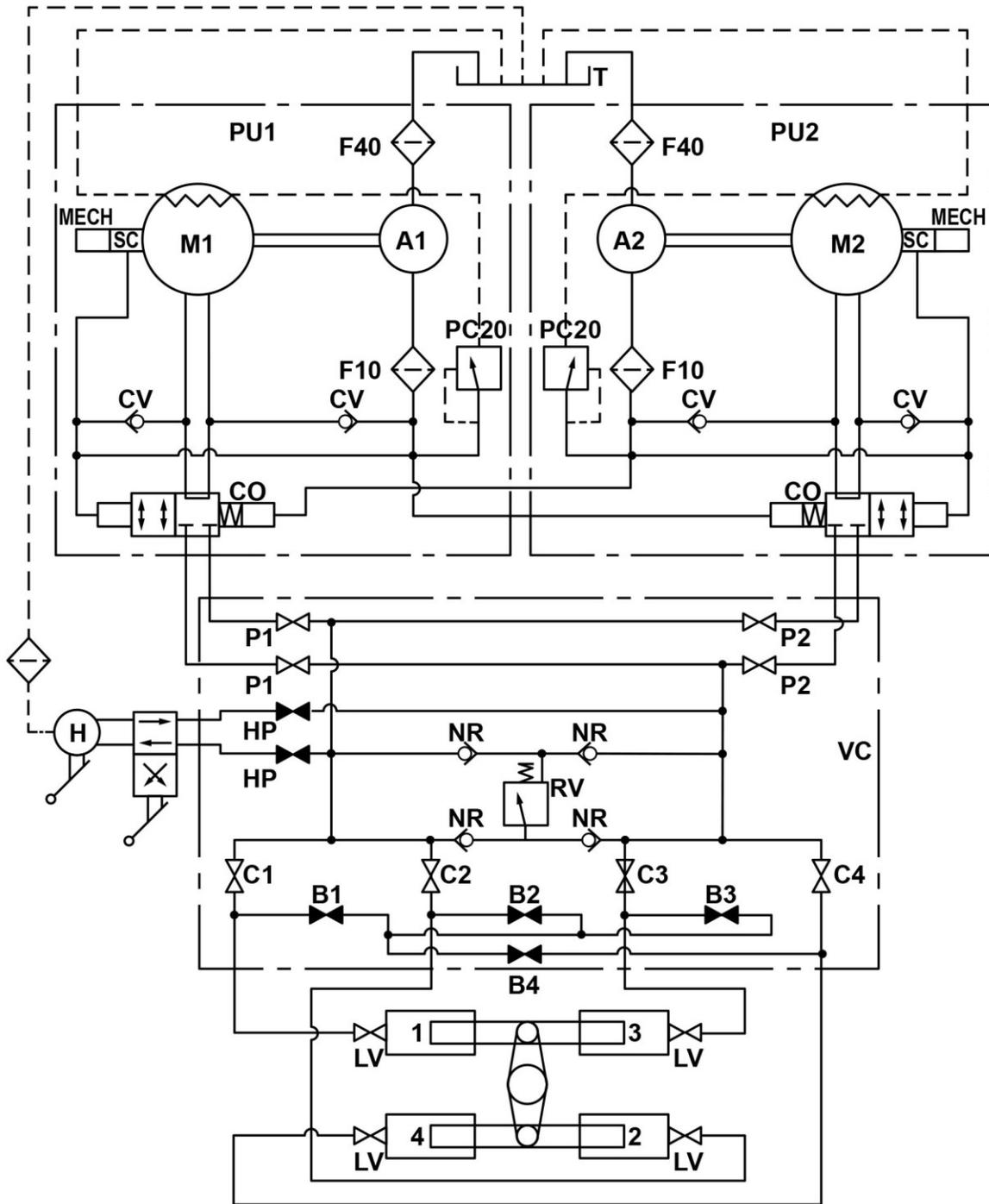
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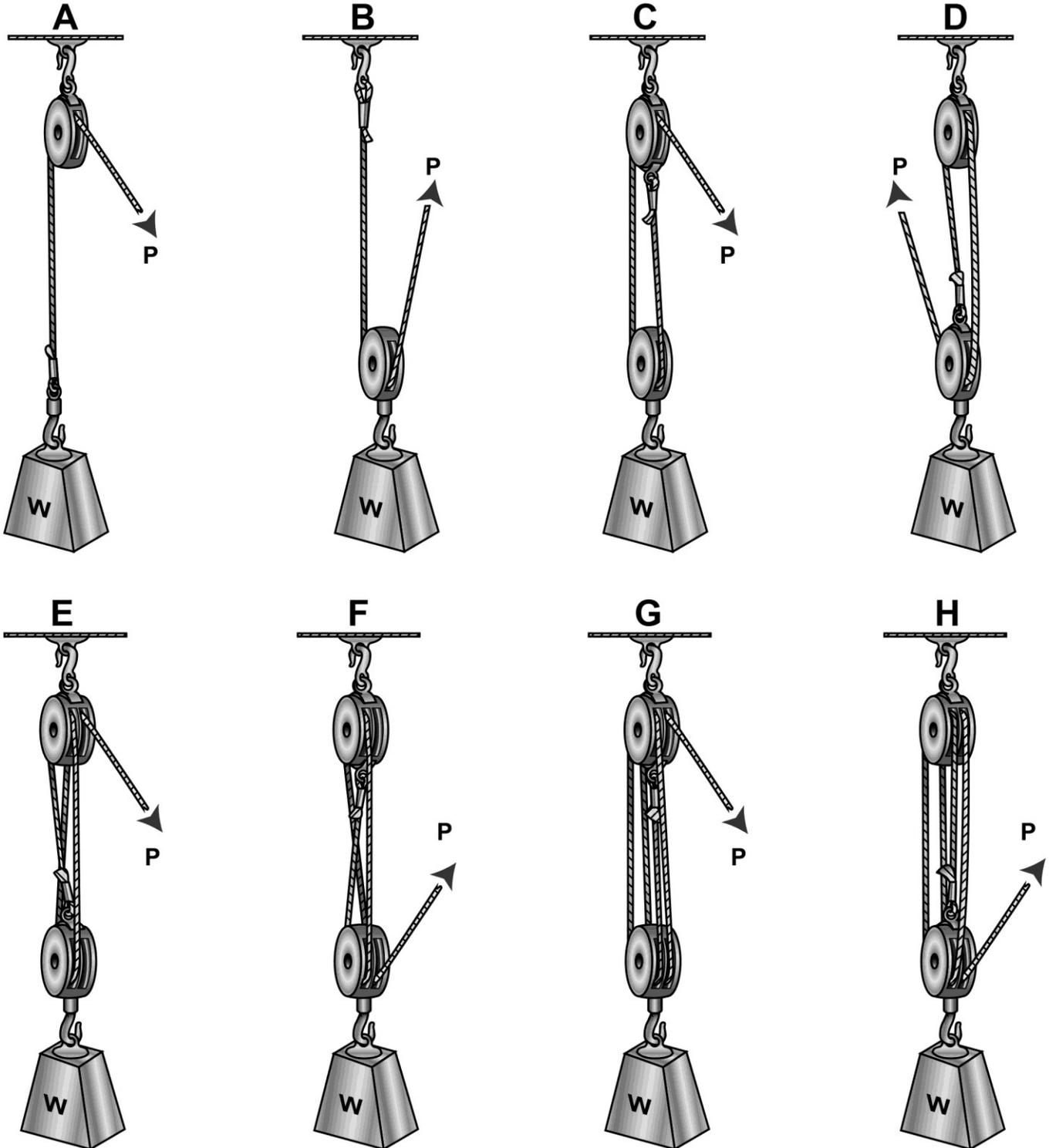


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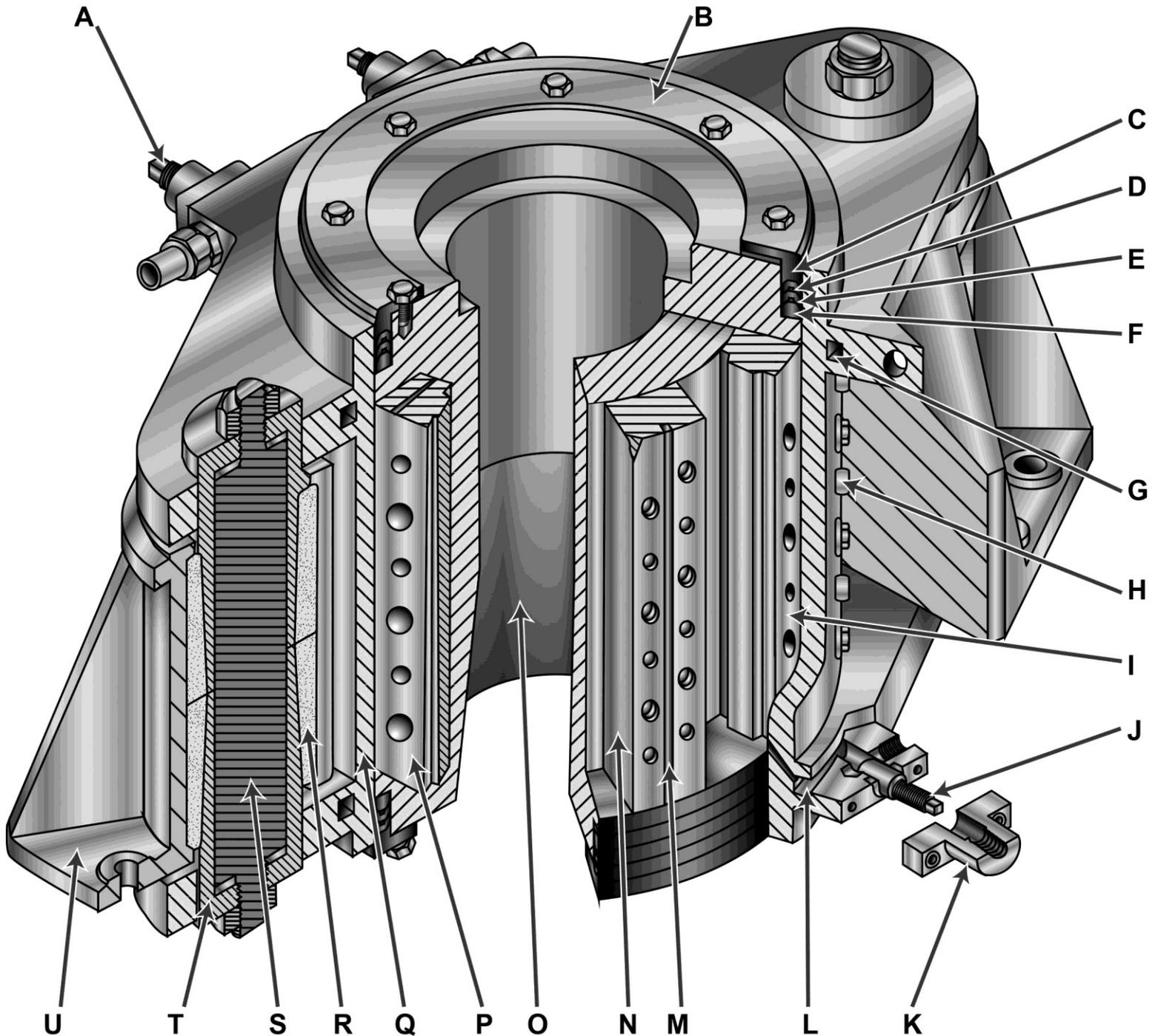


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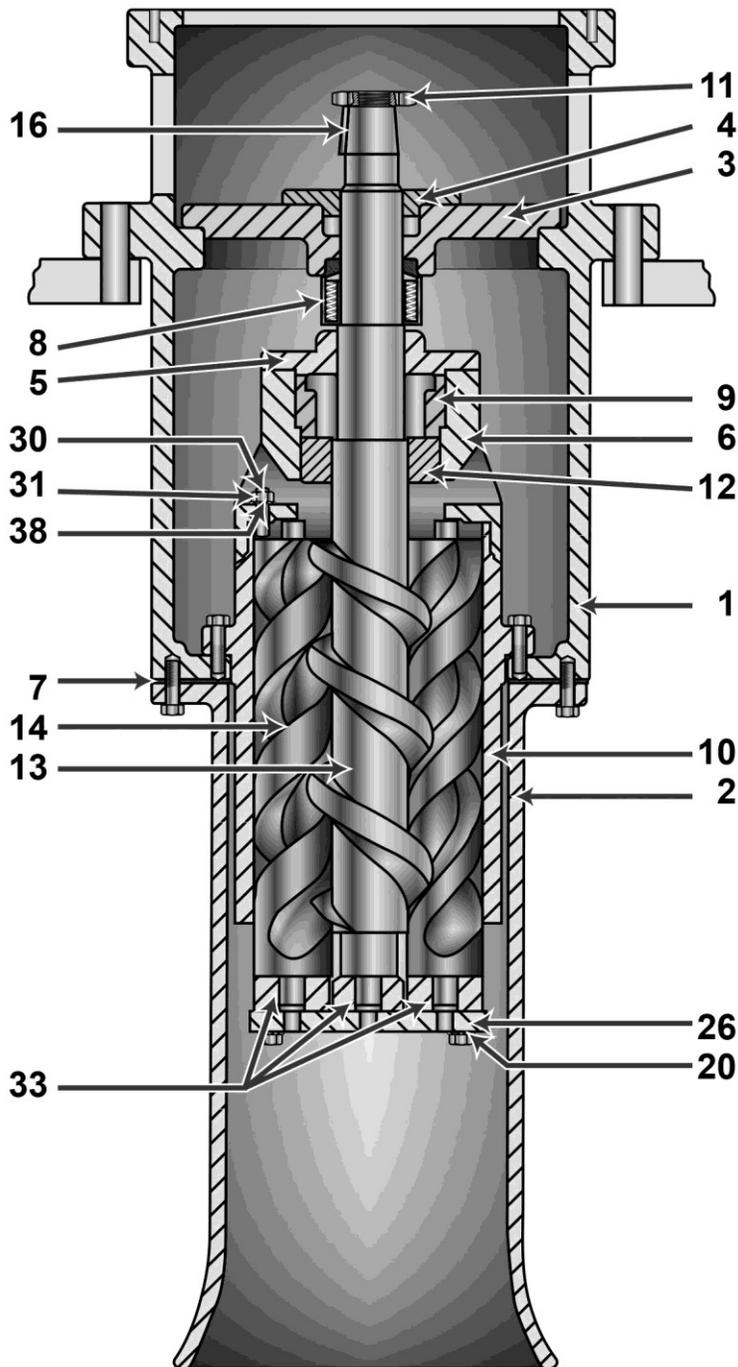


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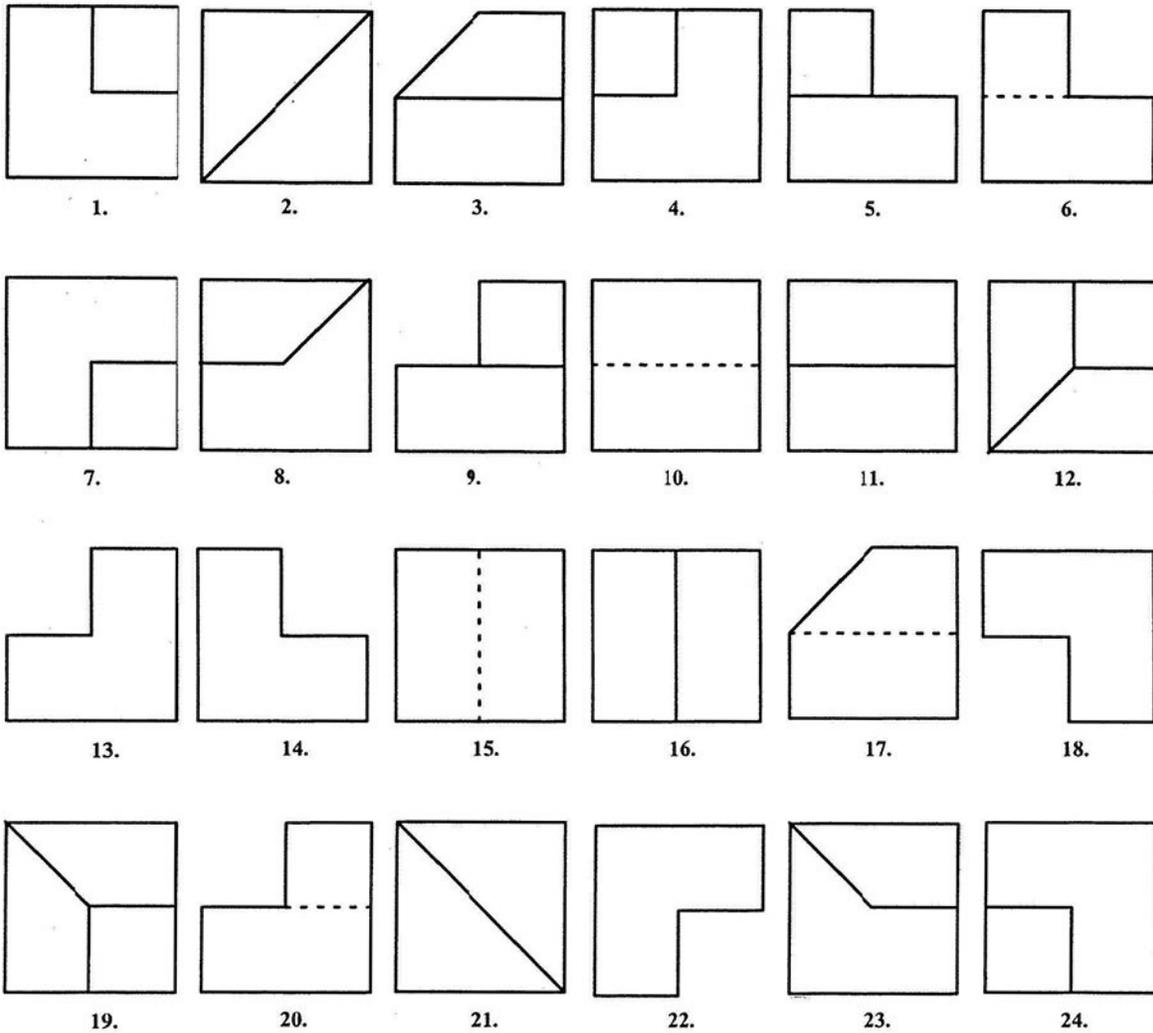
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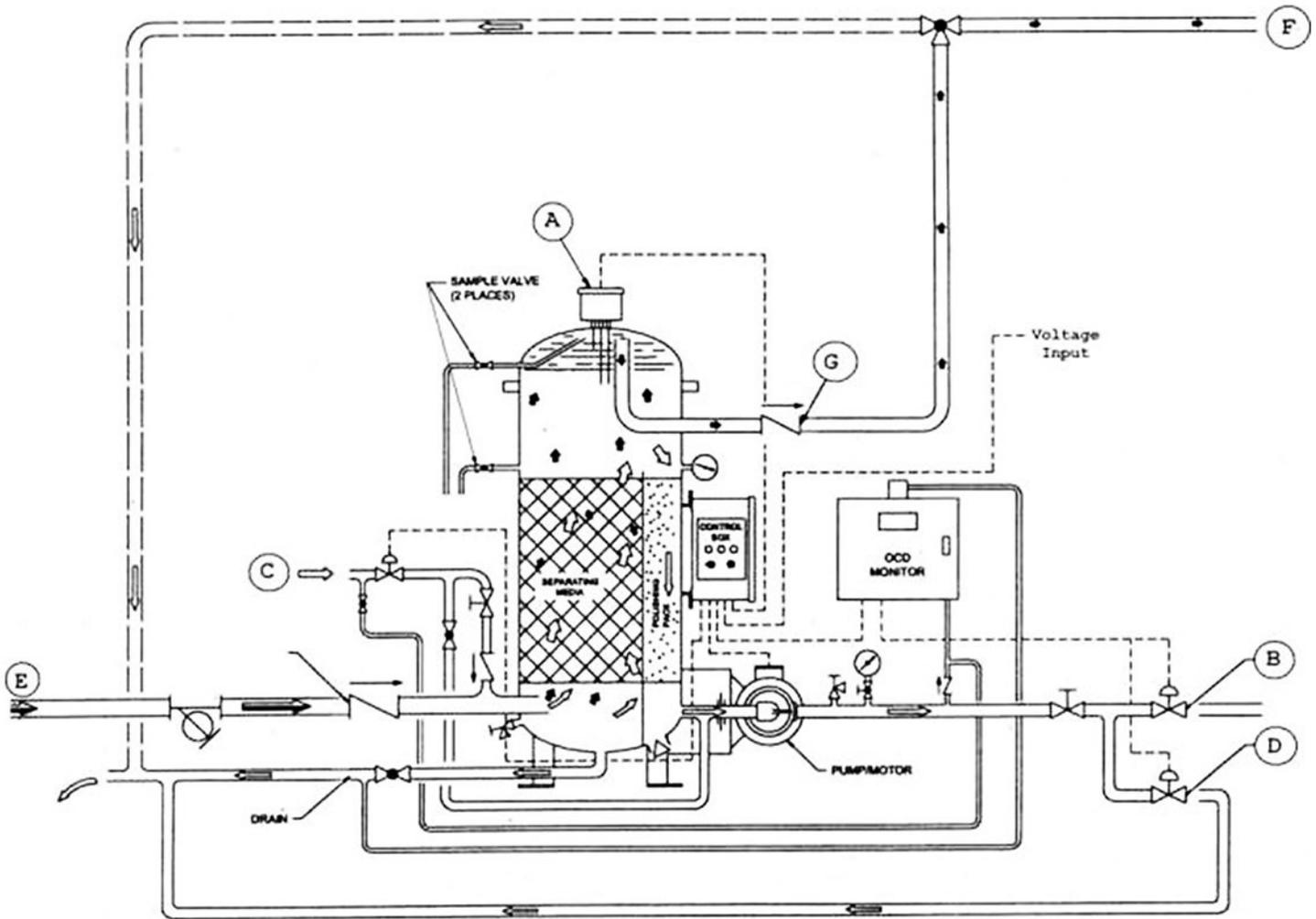


PC NO.	NAME	Material
1	Pump Case	Cast Steel
2	Inlet Bell	Cast Steel
3	Seal Housing	Cast Steel
4	Packing Gland	Gun Metal
5	Bearing Retainer	Bearing Bronze
6	Balance Rotor Housing	Bearing Bronze
7	Gasket	Plant Fiber
8	Mechanical Seal for 2, 3, 8" Dia. Shaft	Steel & Syn. Rubber
9	Spacer	Bearing Bronze
10	Rotor Housing	Bearing Bronze
11	Check Nut	Steel
12	Balance Piston	Steel
13	Power Rotor	Steel
14	Idler Rotor	Steel
15	Socket Head Set Screw 1/4 - 20 x 7/16" long	Steel
16	Key	Steel
17	Bolt 3/8" - 16 x 1" long	Steel
18	Bolt 3/8" - 16 x 1 1/4" long	Steel
19	External Tooth Lockwasher	Steel
20	External Tooth Lockwasher	Steel
21	Bolt 1/4" - 13 x 1 1/4" Long	Steel
22	Socket Head Pipe Plug - 1/8" Size	Brass
23	Inlet Bell	Cast Steel
24	Bolt 1/2" - 13 x 1 1/2" Long	Steel
25	Spacer	Steel Pipe
26	Thrust Plate	Steel
27	Gasket	Plant Fiber
28	Oil Balance Tube	Steel
29	O Ring	Syn. Rubber
30	Stud 5/8" - 11" x 3 1/4" Long	Steel
31	Nut 5/8" - 11" THDS.	Steel
32	Bolt 1/2" - 13 x 4 1/2" Long	Steel
33	Thrust Shoe	Bearing Bronze
34	Lacing Wire 1/16" Dia. x 16 ft. Lg. (Cut to Suit)	Monel
35	Pkg. Ring for 2 3/8" Dia. Shaft 1/4" SQ	Symbol 430
36	Bolt 3/8" - 16" x 1 3/4" Long	Steel
37	Stud 3/4" - 10 x 3" Long	Steel
38	External Tooth Lockwasher	Steel
39	Spring Pin 3/32" x 3/8" Long	Steel
40	Name Plate (Serial)	Brass Sheet
41	Name Plate (Caution)	Brass Sheet
42	Name Plate (Rotation)	Brass Sheet

GS-0165



GS-0175

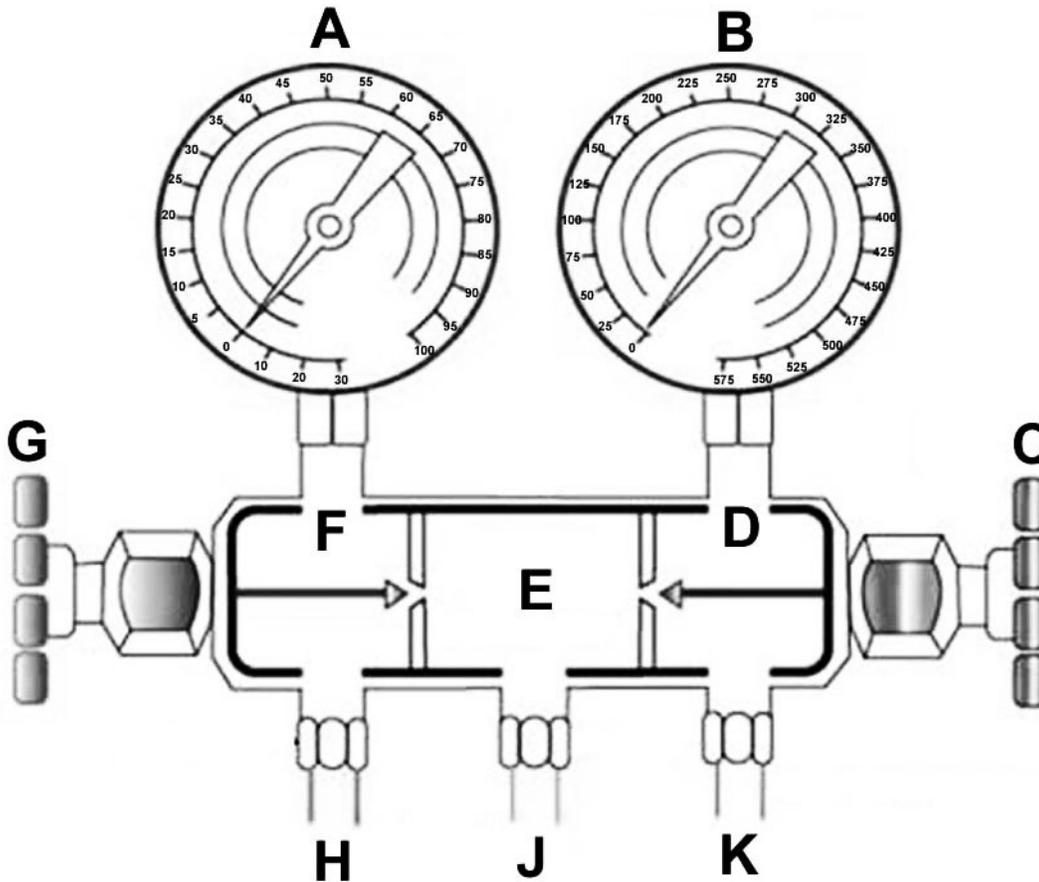


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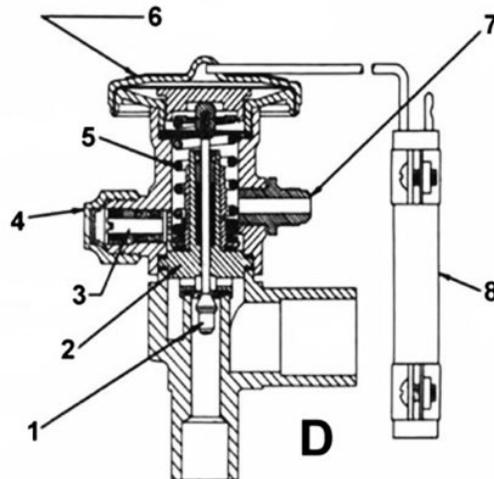
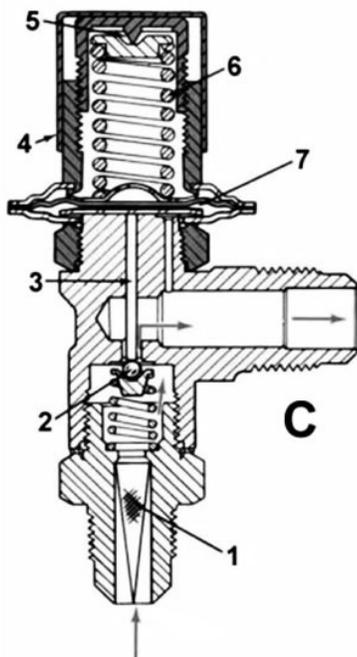
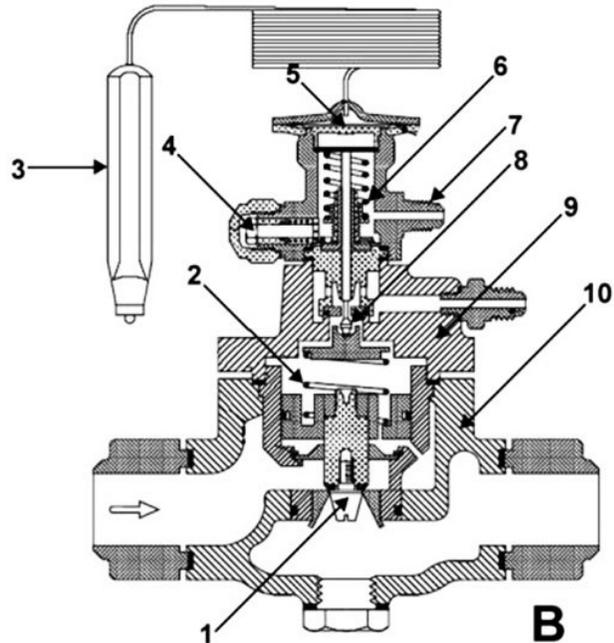
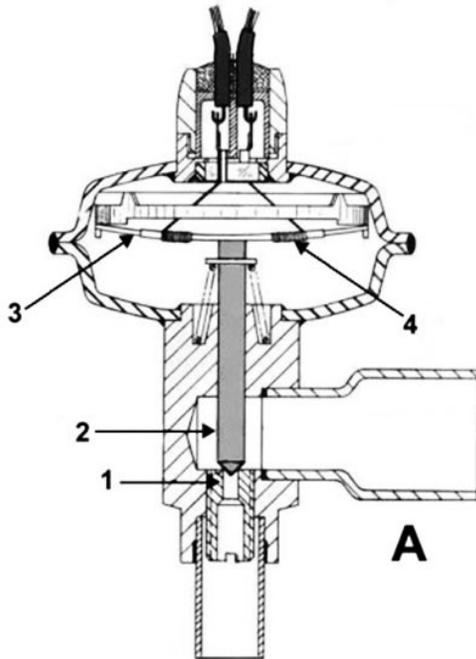
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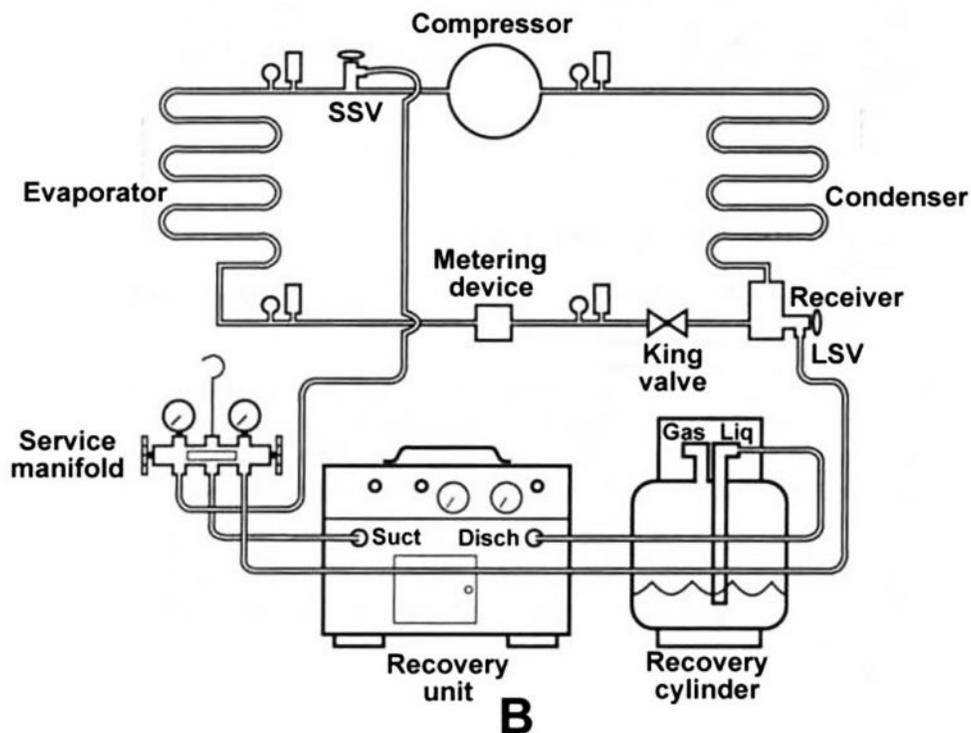
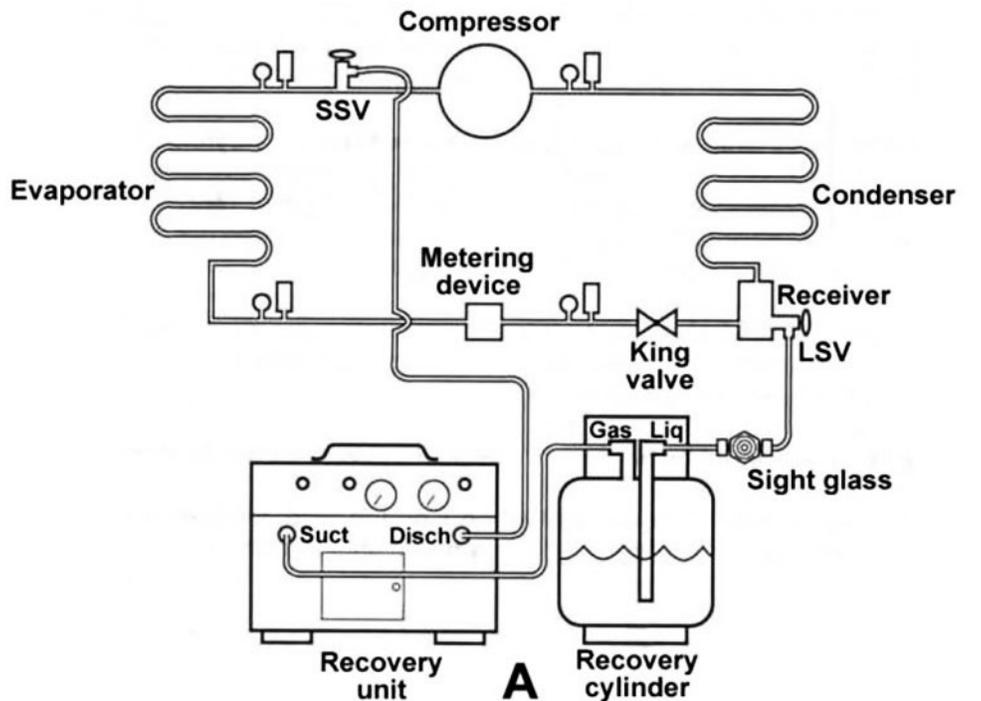
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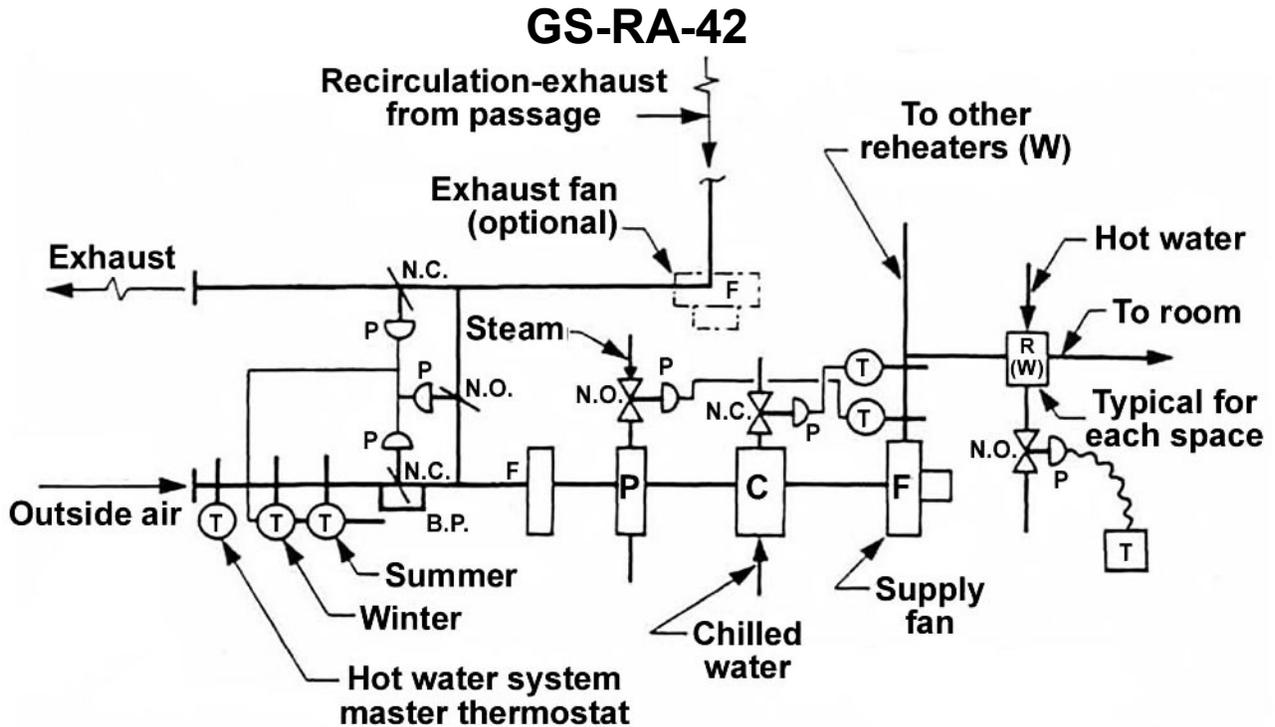
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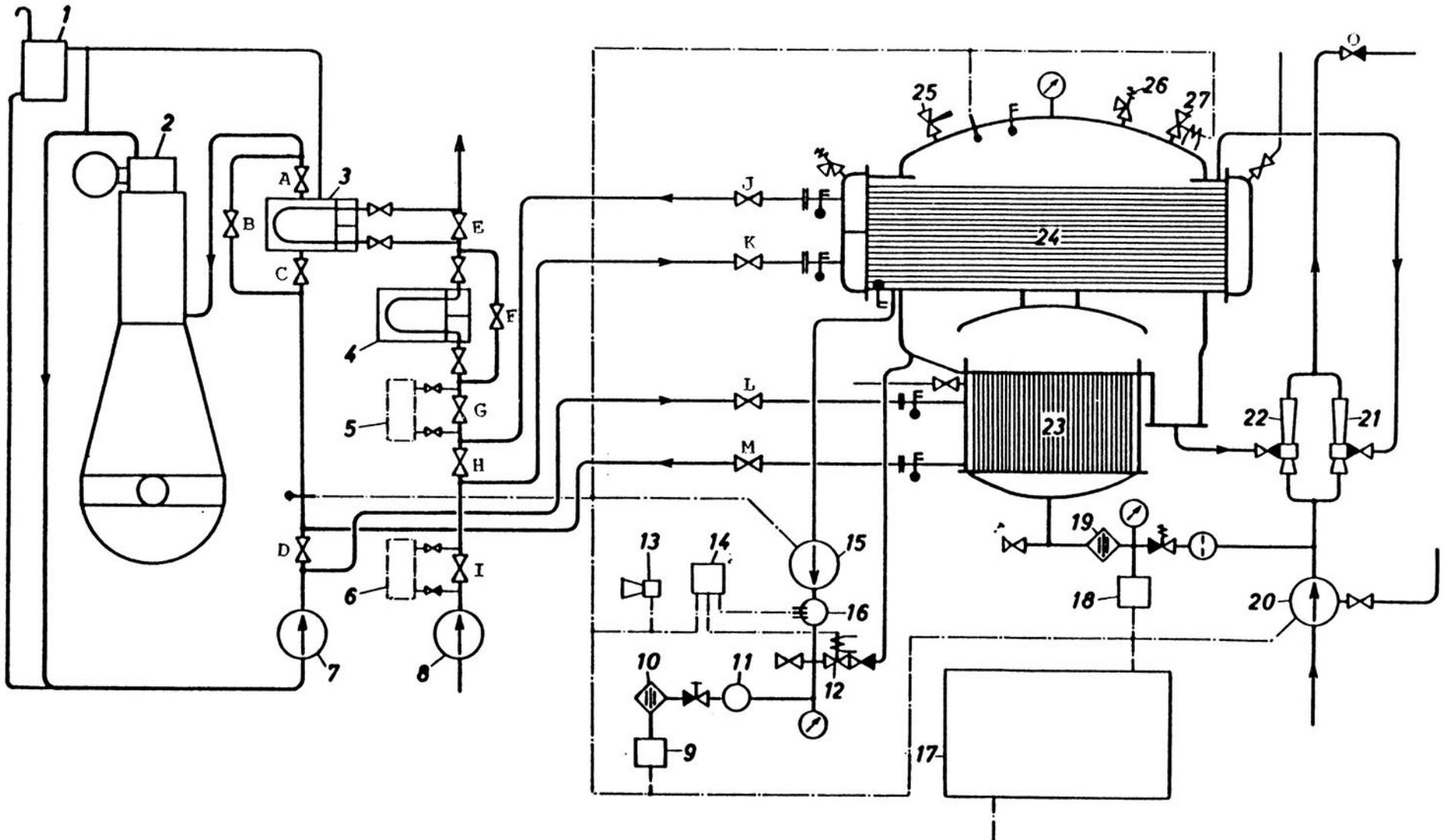


Legend

H Humidistat	T Room thermostat
F Fan	M Dual duct air mixing unit
F Filter	⊗ Pneumatic damper & motor
C Cooling coil	M Master
P Preheater (steam)	SM Sub-master
R Reheater (W=water, S=steam)	P Positive positioning relay
T Duct thermostat	⊗ Pneumatic control valve
N.O. Normally open (valve or damper)	D Diverting relay
N.C. Normally closed (valve or damper)	B.P. Minimum outside air bypass

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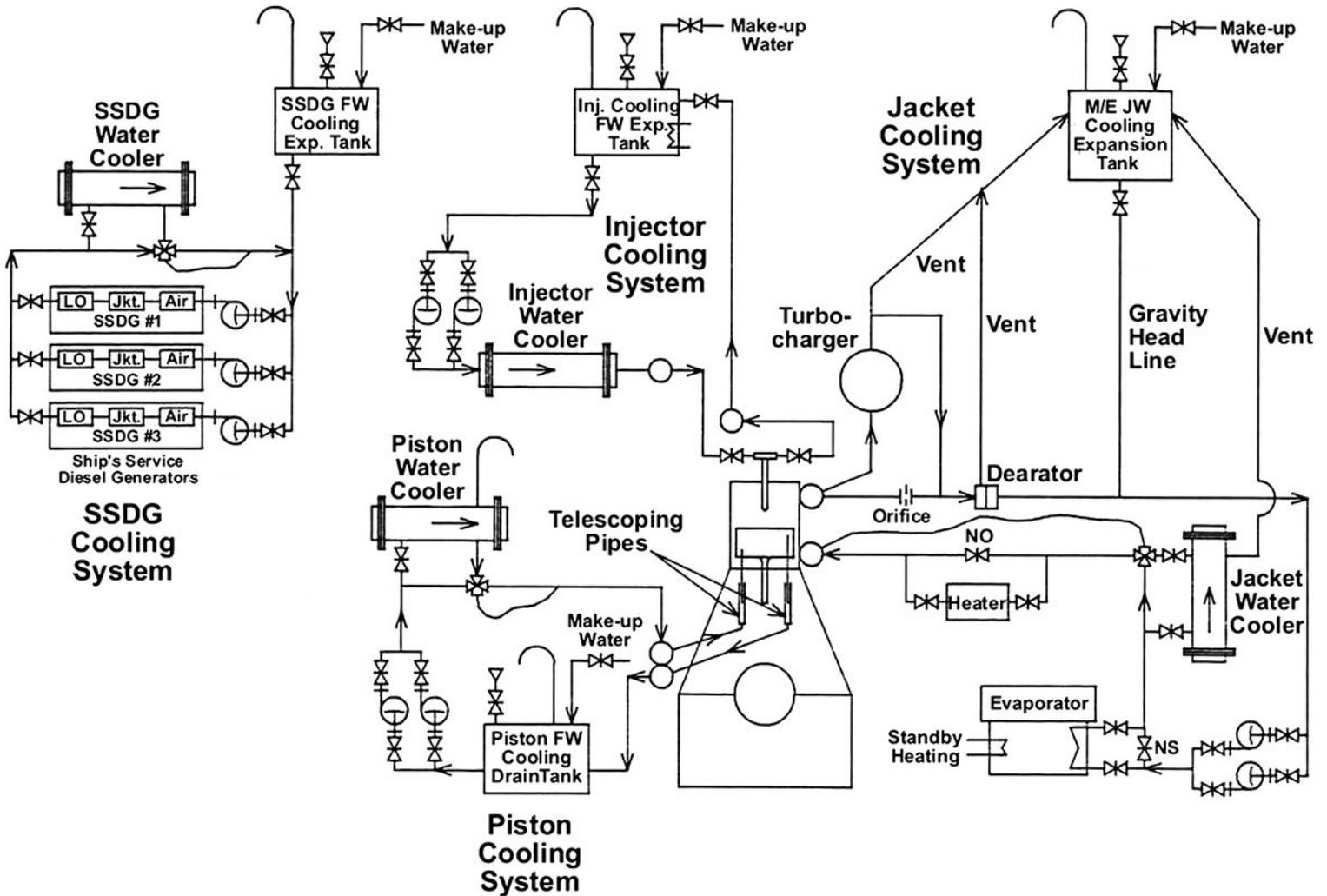
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MP-CW-06

Fresh Water Cooling Systems



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