

U.S.C.G. Merchant Marine Exam
First Assistant Engineer
Q511 General Subjects I
(Sample Examination)

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

1. In a closed-loop process control system, what is meant by error?
- A. The signal in a controller that is obtained by subtracting the measured value of the controlled value from the setpoint.
 - B. The ratio of the amplitude of the output signal of a component divided by the amplitude of the input signal.
 - C. The progressive reduction or suppression of oscillation in a component.
 - D. The criterion of good control that permits no overshoot when the setpoint is changed.

Correct answer: A

2. In a closed-loop process control system, what term is used to describe the undesirable characteristic in which the error of a control system oscillates with constant or increasing amplitude?
- A. Saturation
 - B. Error
 - C. Deadband
 - D. Instability

Correct answer: D

3. In a closed-loop process control system, what is meant by the derivative mode of control?
- A. It is a control mode that produces a control action that is proportional to the error.
 - B. It is a control mode that produces a control action that is proportional to the accumulation of error over time.
 - C. It is a control mode that produces a control action that is proportional to the rate at which the error is changing.
 - D. It is a control mode that produces a control action that is proportional to the gain.

Correct answer: C

4. As a result of a load or setpoint change, in addition to minimizing the maximum value of the error, what are the two additional objectives of a closed-loop control system?
- A. The closed-loop control system should minimize the settling time and minimize the residual error.
 - B. The closed-loop control system should minimize the settling time and maximize the residual error.
 - C. The closed-loop control system should maximize the settling time and minimize the residual error.
 - D. The closed-loop control system should maximize the settling time and maximize the residual error.

Correct answer: A

5. Antifriction bearings can be removed undamaged from a shaft by using an arbor press, or wheel puller with a _____.
- A. split die
 - B. split washer or backup ring
 - C. jack screw
 - D. ring gage

Correct answer: B

6. The bilge system has been performing well; however, the aft starboard engine room bilge well suddenly fails to be pumped out. Which of the following should be done first to determine the cause?
- A. Attempt to pump out another bilge well to determine if the entire system is affected.
 - B. Open the bilge pump for inspection.
 - C. Remove only the manifold valve to the affected bilge well.
 - D. Remove each of the manifold valves.

Correct answer: A

7. If a bilge pump is able to develop vacuum, but is unable to sufficiently pump out the bilges, you would check for all of the following EXCEPT _____.
- A. the circuit breaker
 - B. for leaks in the suction piping
 - C. relief valve is not properly seated
 - D. the suction strainer

Correct answer: A

8. Which of the listed problems could produce a high absolute pressure within a flash type evaporator?
- A. seawater feed temperature below 165°F
 - B. production of high salinity distillate
 - C. a leak in the first stage demister
 - D. a cracked distillate pump vent line

Correct answer: D

9. A high reading is indicated at the salinity cells labeled "SC1", "SC2", and "SC3" shown in the illustration. This is probably the result of which of the following? Illustration GS-0053
- A. a leak in item "HX1"
 - B. erosion of item "OR1"
 - C. faulty cells at each location
 - D. carryover from "FC1"

Correct answer: D

10. The thickest deposit of scale in a flash evaporator is most likely to occur in the tubes of the _____.
- A. first-stage condenser
 - B. flash chamber
 - C. saltwater feed heater
 - D. distillate cooler

Correct answer: C

11. Failure to establish sufficient vacuum when starting up the unit shown in the illustration may be the result of _____ . Illustration MO-0110

- A. improper operation of the brine pump
- B. neglecting to latch the dump valve
- C. neglecting to close the shell vent
- D. improper operation of the distillate pump

Correct answer: C

12. If valve "H" shown in the illustration is opened wide while the distiller is in operation, _____. Illustration MO-0111

- A. the absolute pressure of the unit will not be affected, but the rate of condensation will be decreased
- B. the absolute pressure of the unit will increase due to the increased effect of the air ejector
- C. the absolute pressure of the unit will increase with an associated increase in shell temperature
- D. the absolute pressure of the unit will increase with an associated decrease in shell temperature

Correct answer: C

13. Which of the conditions listed would indicate a large condenser tube leak within the distiller shown in the illustration? Illustration MO-0111

- A. A decrease in the level of the main engine expansion tank as indicated by a low-level alarm.
- B. A slow continuous rise in the lube oil cooler outlet temperature indicated at device "4".
- C. The activation of the salinity monitoring equipment's annunciator circuit.
- D. An increase in distiller output resulting from the combination of jacket water and the distillate produced.

Correct answer: C

14. If a reverse osmosis fresh water generating unit has a high salinity alarm associated with the freshwater outlet, what should be done?

- A. The membrane modules should be flushed and cleaned.
- B. The post-treatment sterilizer should be serviced.
- C. The pre-treatment chemical doser should be serviced.
- D. The pre-filters should be serviced by cleaning or replacement.

Correct answer: A

15. Under what conditions would the pre-treatment capabilities of a reverse osmosis freshwater generator MOST likely be overloaded, and as a result, these conditions should generally be avoided?

- A. Entering harbors.
- B. Entering open seas.
- C. Entering low temperature seas.
- D. Entering high temperature seas.

Correct answer: A

16. The instrument always used in conjunction with a salinometer is a _____.

- A. hygrometer
- B. hydrometer
- C. thermometer
- D. pyrometer

Correct answer: C

17. A salinity indicating system functions on the basic principle of measuring the _____.

- A. specific gravity of water
- B. hydrogen ion concentration of water
- C. electrical inductance of water
- D. electrical conductivity of water

Correct answer: D

18. What design feature is used to minimize potable water wastage associated with hot water distribution piping for a potable water system?

- A. Use of storage type hot water heaters only.
- B. Use of instantaneous type hot water heaters only.
- C. Use of hot water recirculation loops.
- D. Use of hot water heaters with multiple heat sources.

Correct answer: C

19. What are the operating characteristics of a "waterlogged" potable water system hydro-pneumatic header tank that needs to be recharged with compressed air?

- A. Failure of the potable water pump to stop with zero demand on the system.
- B. Failure of the potable water pump to start with demand on the system.
- C. Very short and frequent running and idle periods for the potable water pump.
- D. Extremely long running and idle periods for the potable water pump.

Correct answer: C

20. Which of the following statements is true concerning the application for an isochronous governor?

- A. An isochronous governor is ideally suited for a ship's geared propulsion drive driving through a fixed pitch propeller.
- B. An isochronous governor is ideally suited for a pump drive associated with maintaining a constant pump discharge pressure.
- C. An isochronous governor is ideally suited for a ship's direct-reversible propulsion drive driving through a fixed pitch propeller.
- D. An isochronous governor is ideally suited for a ship's service alternator drive associated with maintaining a constant system frequency.

Correct answer: D

- 21.** Which statement is true concerning the term "isochronous" as it applies to prime mover speed control governors?
- A. Isochronous governors are able to maintain constant prime mover speed regardless of load by employing temporary speed droop.
 - B. Isochronous governors are able to maintain constant prime mover load regardless of speed by employing temporary speed droop.
 - C. Isochronous governors are able to maintain constant prime mover speed regardless of load by employing permanent speed droop.
 - D. Isochronous governors are able to maintain constant prime mover load regardless of speed by employing permanent speed droop.

Correct answer: A

- 22.** Referring to the illustrated motor ship freshwater cooling system drawing, what statement is true concerning the main engine jacket water cooling temperature control system? Illustration MO-0212
- A. The main engine jacket water 3-way temperature control valve is setup as a diverter and is used to control the main engine jacket water outlet header temperature.
 - B. The main engine jacket water 3-way temperature control valve is setup as a mixer and is used to control the main engine jacket water inlet header temperature.
 - C. The main engine jacket water 3-way temperature control valve is setup as a mixer and is used to control the main engine jacket water outlet header temperature.
 - D. The main engine jacket water 3-way temperature control valve is setup as a diverter and is used to control the main engine jacket water inlet header temperature.

Correct answer: B

- 23.** On deep-draft ships, what statement is true concerning high and low sea suctions for machinery space sea water cooling systems?
- A. A high sea suction is located near the turn of the bilge and is used primarily in port or when operating in shallow water, and a low sea suction is located near the bottom of the ship and is used primarily while underway.
 - B. A high sea suction is located near the turn of the bilge and is used primarily while underway, and a low sea suction is located near the bottom of the ship and is used primarily in port or when operating in shallow water.
 - C. A low sea suction is located near the turn of the bilge and is used primarily while underway, and a high sea suction is located near the bottom of the ship and is used primarily in port or when operating in shallow water.
 - D. A low sea suction is located near the turn of the bilge and is used primarily in port or when operating in shallow water, and a high sea suction is located near the bottom of the ship and is used primarily while underway.

Correct answer: A

- 24.** Referring to the illustrated motor ship freshwater cooling system drawing, what statement is true concerning the turbocharger bypass line associated with the jacket water cooling system? Illustration MO-0212
- A. The turbocharger cooling water bypass line with the control orifice works in conjunction with the deaerator to remove entrained air from the jacket water outlet.
 - B. The turbocharger cooling water bypass line with the control orifice proportions the cooling water flow so that the turbocharger receives a lesser flow rate of cooling water as compared to the main engine cooling water jackets.
 - C. The turbocharger cooling water bypass line with the control orifice proportions the cooling water flow so that the turbocharger receives a greater flow rate of cooling water as compared to the main engine cooling water jackets.
 - D. The turbocharger cooling water bypass line with the control orifice proportions the cooling water flow so that the turbocharger receives the same flow rate of cooling water as does the main engine cooling water jackets.

Correct answer: B

- 25.** In attempting to start the hydraulic pump drive motor of a horizontal electro-hydraulic anchor windlass, what condition would prevent the electric motor from starting?
- A. Failure to start could be the result of an electrical interlock associated with handwheel operated wildcat band brakes being set.
 - B. Failure to start could be the result of an electrical interlock associated with the hydraulic pump stroke control being in other than the neutral position.
 - C. Failure to start could be the result of an electrical interlock associated with the wildcat clutches being disengaged.
 - D. Failure to start could be the result of an electrical interlock associated with the hydraulic pump stroke control being in the neutral position.

Correct answer: B

- 26.** A horizontal electro-mechanical anchor windlass is equipped with two warping heads, two wildcats, two manual brake handwheels, two clutch control levers, and a multipoint lever-operated, pedestal-mounted controller. What statement is true as it pertains to the operation of the manual brake handwheels?
- A. The manual brake handwheels control band brakes that are associated with the wildcats only.
 - B. The manual brake handwheels control band brakes that are associated with both the wildcats and the warping heads.
 - C. The manual brake handwheels control band brakes that are associated with either the wildcats or the warping heads, depending upon the windlass design.
 - D. The manual brake handwheels control band brakes that are associated with the warping heads only.

Correct answer: A

- 27.** As it pertains to raising and lowering an anchor with a horizontal electro-hydraulic or electro-mechanical anchor windlass, what statement is true?
- A. The anchor can be either raised or lowered under power with the windlass by engaging the wildcat clutch. The anchor can be lowered by gravity by controlling the anchor chain payout with the wildcat manual brake with the wildcat clutch disengaged.
 - B. The anchor can only be raised (and not lowered) under power with the windlass by engaging the wildcat clutch. The anchor can be lowered by gravity by controlling the anchor chain payout with the wildcat manual brake with the wildcat clutch disengaged.
 - C. The anchor can be either raised or lowered under power with the windlass by disengaging the wildcat clutch. The anchor can be lowered by gravity by controlling the anchor chain payout with the wildcat manual brake with the wildcat clutch engaged.
 - D. The anchor can only be raised (and not lowered) under power with the windlass by disengaging the wildcat clutch. The anchor can be lowered by gravity by controlling the anchor chain payout with the wildcat manual brake with the wildcat clutch engaged.

Correct answer: A

- 28.** What statement is true concerning the door interlock devices associated with a winding drum or traction drive passenger elevator onboard ship?
- A. Door interlocks are used to prevent elevator operation if the doors are still closed and only allow elevator operation if the doors are proved open.
 - B. Door interlocks are used to prevent elevator operation in a shipboard emergency when elevators are not to be used.
 - C. Door interlocks are used to over-ride elevator emergency status in a shipboard emergency when elevators are required to be used.
 - D. Door interlocks are used to prevent elevator operation if the doors are still open and only allow elevator operation if the doors are proved closed.

Correct answer: D

- 29.** As it pertains to the luffing motion limits associated with an electro-hydraulic cargo-handling pedestal-type deck crane, what statement is true?
- A. When the hoist block is raised to a maximum permissible height with respect to the boom, the luffing pump shall be placed on stroke and the luffing winch brake released.
 - B. When the hoist block is raised to a maximum permissible height with respect to the boom, the luffing pump shall be stroked to zero and the luffing winch brake set.
 - C. When the boom is raised to a maximum permissible height or lowered to a minimum permissible height, the luffing pump shall be stroked to zero and the luffing winch brake set.
 - D. When the boom is raised to a maximum permissible height or lowered to a minimum permissible height, the luffing pump shall be placed on stroke and the luffing winch brake released.

Correct answer: C

- 30.** Which capstan drive arrangement requires a flexible coupling between the reduction gear output shaft and the capstan head input shaft?
- A. The drive arrangement where the drive motor, electric brake, gear reducer are mounted on the deck below the weather deck, and only the capstan head is located on the weather deck.
 - B. The drive arrangement where the drive motor, electric brake, gear reducer, and capstan head are all located on the weather deck.
 - C. The drive arrangement where the drive motor, electric brake, gear reducer are hung from the underside of the weather deck, and only the capstan head is located on the weather deck.
 - D. A flexible coupling is required on all three drive arrangements listed above.

Correct answer: A

- 31.** A hydraulic system flow control circuit is shown in the illustration and is known as a _____. Illustration GS-0105
- A. metered-in circuit
 - B. bleed-in circuit
 - C. metered-out circuit
 - D. bleed-off circuit

Correct answer: A

- 32.** In order for the hydraulic pump installed in a constant flow system to maintain adequate flow, the pump suction should _____.
- A. be arranged to develop a maximum vacuum of approximately 10" of mercury
 - B. be arranged to develop the theoretically maximum attainable vacuum
 - C. be provided with three to five 1/2 inch holes in the vertical, suction line to prevent pump starvation should the strainer become fouled
 - D. be taken directly off the reservoir bottom without regard to filters or strainers

Correct answer: A

- 33.** A hydraulic system flow control circuit is shown in the illustration and is known as a _____. Illustration GS-0106
- A. metered-in circuit
 - B. metered-out circuit
 - C. bleed-in circuit
 - D. bleed-off circuit

Correct answer: B

- 34.** When new piping sections have been fabricated for installation in a hydraulic system, prior to installation the piping should be _____.
- A. descaled by using a pickling solution
 - B. hydrostatically tested to 100% of maximum working pressure
 - C. cleaned using a water-based detergent
 - D. all of the above

Correct answer: A

35. Before doing any work on a hydraulic system equipped with accumulators, you should _____.

- A. drain the accumulators and purge with oxygen
- B. pump the hydraulic fluid into the accumulators to prevent fluid loss
- C. completely charge the accumulators to prevent system energy loss
- D. bleed off all stored energy from the accumulators

Correct answer: D

36. After installing a new hydraulic pump in a system, what special attention should be given to the hydraulic system?

- A. The filters and strainers should be checked frequently.
- B. All system pressure should be readjusted.
- C. The relief valves in the system should be readjusted.
- D. The system should be drained and renewed with a fluid of different operating characteristics.

Correct answer: A

37. If you attempt to tighten a leaking hydraulic fitting with pressure on the system, you will _____.

- A. dislodge any scale in the tubing, and it will damage the system
- B. find that the pressure will prevent the components from being tightened
- C. be successful every time
- D. cause the system to vibrate

Correct answer: B

38. A hydraulic cylinder is fitted with a cushioning device. The piston abruptly slows towards the end of its stroke, then continues to creep to the completion of its stroke. Which of the following represents the probable cause?

- A. The rod wiper is jammed in the cushion spear.
- B. The exhaust oil is flowing freely through the cushion nose.
- C. The cushion adjustment needle valve is open too far.
- D. The cushion adjustment needle valve is not open sufficiently.

Correct answer: D

39. A hydraulic system gear pump being fed from a reservoir frequently indicates signs of excessive pitting after two months of service. Which of the following would most likely contribute to this condition?

- A. Abnormal pressurization is occurring in the reservoir.
- B. Operating oil temperature is determined to be below normal.
- C. A partial restriction in the return line has developed.
- D. A vacuum condition has developed in the reservoir.

Correct answer: D

40. If a radial piston hydraulic pump fails to deliver rated fluid volume, the cause can be _____.

- A. obstructed suction passage
- B. contaminated fluid
- C. pitted thrust rings
- D. worn pintle bearings

Correct answer: A

41. In a forced-feed lubrication system, what statement is true concerning lube oil reservoir/sump residence time?

- A. The higher the oil level, the longer the residence time, and the cooler the oil will be as delivered by the pump.
- B. The higher the oil level, the shorter the residence time, and the cooler the oil will be as delivered by the pump.
- C. The higher the oil level, the longer the residence time, and the hotter the oil will be as delivered by the pump.
- D. The higher the oil level, the shorter the residence time, and the hotter the oil will be as delivered by the pump.

Correct answer: A

42. 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

Correct answer: C

43. If the bearings of a piece of machinery are fed by a gravity feed lubricating oil system, what statement is true concerning the vertical arrangement of the lube oil tanks?

- A. The lube oil gravity tank and the lube oil reservoir/sump are both above the points of lubrication.
- B. The lube oil gravity tank is below the points of lubrication and the lube oil reservoir/sump is above the points of lubrication.
- C. The lube oil gravity tank is above the points of lubrication and the lube oil reservoir/sump is below the points of lubrication.
- D. The lube oil gravity tank and the lube oil reservoir/sump are both below the points of lubrication.

Correct answer: C

44. Which of the following lube oil filters would be considered acceptable for use with today's high detergent additive type oils?

- A. Cotton waste packed in perforated metal containers or cylindrical cartridges.
- B. Cylindrical elements containing Fuller's earth combined with cellulose.
- C. Chemically treated paper and waste in cartridges.
- D. Foamed polyurethane of the impingement type supported on perforated metal rings.

Correct answer: A

45. Which of the filter/strainer units listed permits you to clean the element while leaving the system on the line?

- A. Canister
- B. Simplex
- C. Duplex
- D. Bypass

Correct answer: C

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

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

Correct answer: C

47. The components indicated as "7" and "8" as shown in the illustration, are known as the _____. Illustration GS-0153

- A. inlet weir and inlet baffle
- B. second stage oil separator and drip pan
- C. first stage oil separator and drip pan
- D. outlet weir and outlet baffle

Correct answer: A

48. The component labeled "A", as shown in the illustration, would be identified as the _____. Illustration GS-0175

- A. oil content monitor probe
- B. separator vessel pressure relief valve
- C. separator vessel vacuum breaker
- D. oil/water interface level sensing probe

Correct answer: D

49. Referring to the illustration, suppose after initiating the oil discharge mode, the oily-water separator fails to come out of the oil discharge mode in a timely fashion. Cracking open the upper sampling valve reveals the presence of oil exiting under positive pressure. What is most likely the cause? Illustration GS-0175

- A. The oil discharge check valve fails to open, and as a result no oil actually discharges.
- B. The upper oil/water interface detection probe fails to end the oil discharge mode.
- C. The clean water supply solenoid fails to open, and as a result provides no discharge pressure.
- D. The lower oil/water interface detection probe fails to initiate the oil discharge mode.

Correct answer: A

50. If item "1" in the illustrated oily-water separator indicates an abnormally deep vacuum, which of the following conditions is the most probable cause? Illustration GS-0153

- A. Process water inlet valve, item "5", is open.
- B. Coalescer beds are severely fouled.
- C. Suction line inlet strainer is obstructed.
- D. No problem exists as a high vacuum should be maintained in the chamber whose vacuum is to be measured.

Correct answer: C

51. What is the length of the stud used to secure the packing gland shown in the illustration? Illustration GS-0012

- A. 1 inch
- B. 1 1/4 inches
- C. 1 1/2 inches
- D. 2 1/2 inches

Correct answer: D

52. In the illustration shown, an efficient seal is maintained between the suction cover and the volute by _____. Illustration GS-0012

- A. good metal-to-metal contact
- B. sealant between the two parts
- C. an ptfе/glass fiber reinforced gasket
- D. compressing the packing rings

Correct answer: C

53. Which of the tolerances listed is allowed on the outside diameter of the bushing illustrated? Illustration GS-0017

- A. 0.0005 inch
- B. 0.002 inch
- C. 0.060 inch
- D. 1.6015 inches

Correct answer: A

54. Dimension "X" indicated on the architects scale, shown in the illustration, will be equal to _____. Illustration GS-0023

- A. 5 feet 3/4 inch
- B. 5 feet 4 inches
- C. 83 feet
- D. 93 1/4 feet

Correct answer: B

55. The type of thread illustrated is a/an _____. Illustration GS-0038

- A. acme thread
- B. national coarse thread
- C. square thread
- D. cannot be determined from information provided

Correct answer: B

- 56.** 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. Tandem propeller
 - B. Helicoidal propeller
 - C. Cycloidal propeller
 - D. Contra-rotating propeller

Correct answer: C

- 57.** Which of the following propulsor types represents the proper terminology for electric propulsion where the drive motors are outside the ship's hull?
- A. Azimuthing propulsor
 - B. Jet drive
 - C. Cycloidal propeller
 - D. Azipod propulsor

Correct answer: D

- 58.** When an electricity generating plant features shaft-driven generators, what type of propulsor is generally used for main propulsion?
- A. Fixed-pitch propeller
 - B. Controllable-pitch propeller
 - C. Tandem propellers
 - D. Detachable-blade (built-up) propeller

Correct answer: B

- 59.** With respect to a "tractor" type azimuthing thruster, what statement is true?
- A. With an azimuthing angle of 0° , the azimuthing thruster's propeller is directly abaft of and in the wake of the gear unit.
 - B. With an azimuthing angle of 0° , the gear unit is directly abaft of the azimuthing thruster's propeller, but the azimuthing thruster's propeller is in the wake of the gear unit.
 - C. With an azimuthing angle of 0° , the gear unit is directly abaft of and in the wake of the azimuthing thruster's propeller.
 - D. With an azimuthing angle of 0° , the azimuthing thruster's propeller is directly abaft of the gear unit, but the gear unit is in the wake of the azimuthing thruster's propeller.

Correct answer: C

- 60.** What statement represents the fundamental difference between an azimuthing thruster and a podded propulsor?
- A. With an azimuthing thruster the prime mover is located inside the hull, and with a podded propulsor the prime mover is located outside the hull.
 - B. With an azimuthing thruster the thruster is steerable, and with a podded propulsor the propulsor is not steerable.
 - C. With an azimuthing thruster the prime mover is located outside the hull, and with a podded propulsor the prime mover is located inside the hull.
 - D. With an azimuthing thruster the thruster is not steerable, and with a podded propulsor the propulsor is steerable.

Correct answer: A

- 61.** Of the following propulsion modes, which one would operate with a geared-drive featuring a double reduction?
- A. Slow speed diesel
 - B. Medium speed diesel
 - C. High speed diesel
 - D. Gas turbine

Correct answer: D

- 62.** Concerning main propulsion reduction gears, what statement is true?
- A. The reduction gear allows the prime mover to rotate efficiently at relatively high speed and low torque and allows the propeller to rotate efficiently at relatively low speed and high torque.
 - B. The reduction gear allows the prime mover to rotate efficiently at relatively high speed and high torque and allows the propeller to rotate efficiently at relatively low speed and low torque.
 - C. The reduction gear allows the prime mover to rotate efficiently at relatively low speed and low torque and allows the propeller to rotate efficiently at relatively high speed and high torque.
 - D. The reduction gear allows the prime mover to rotate efficiently at relatively low speed and high torque and allows the propeller to rotate efficiently at relatively high speed and low torque.

Correct answer: A

- 63.** If a main propulsion shafting arrangement is such that a strut and strut bearing is required, what is the name of the section of shafting that passes through the hull penetration to the closest watertight bulkhead?
- A. Tail or propeller shaft
 - B. Line shaft
 - C. Thrust shaft
 - D. Stern tube shaft

Correct answer: D

- 64.** What statement is true concerning the arrangement of line shaft bearing housings?
- A. Line shaft bearing housings are typically single-piece pedestal type bearing housings.
 - B. Line shaft bearing housings are typically single-piece flange type bearing housings.
 - C. Line shaft bearing housings are typically split half flange type bearing housings.
 - D. Line shaft bearing housings are typically split half pedestal type bearing housings.

Correct answer: D

65. Which type of Marine Sanitation Device (MSD) is used solely for the storage of sewage and flushwater at ambient air pressure and temperature?

- A. Type I
- B. Type II
- C. Type III
- D. Type IV

Correct answer: C

66. Marine sanitation devices installed on vessels must be certified by the _____.

- A. U.S. Coast Guard
- B. American Bureau of Shipping
- C. Society of Naval Architects and Marine Engineers
- D. Environmental Protection Agency

Correct answer: A

67. Coast Guard regulations concerning marine sanitation devices may be found in _____.

- A. 33 CFR Section 159
- B. 33 CFR Section 153
- C. 33 CFR Section 155
- D. 33 CFR Section 156

Correct answer: A

68. In the illustrated schematic, which component is the device that was used to replace the six-way valve, as found on many older type steering gears? Illustration GS-0123

- A. "A"
- B. "B"
- C. "F"
- D. "H"

Correct answer: A

69. When the helm angle position is changed, the series of corresponding events of the steering gear will include _____.

- I. rate of steering gear ram movement will be proportional to amount of helm angle input
- II. degree of tilting plate (box) angle will be proportional to the amount of helm angle input

- A. I only
- B. II only
- C. Both I and II
- D. Neither I nor II

Correct answer: C

- 70.** A command signal input to the steering gear has initiated rudder movement for 20° right rudder. The follow-up mechanism at the beginning of the rudder movement will _____. Illustration GS-0123
- A. be in motion with a null input
 - B. not be in motion, thus a null input
 - C. be in motion providing an input to place the variable stroke pump on maximum stroke
 - D. be in motion providing an input to place the variable stroke pump at null stroke

Correct answer: A

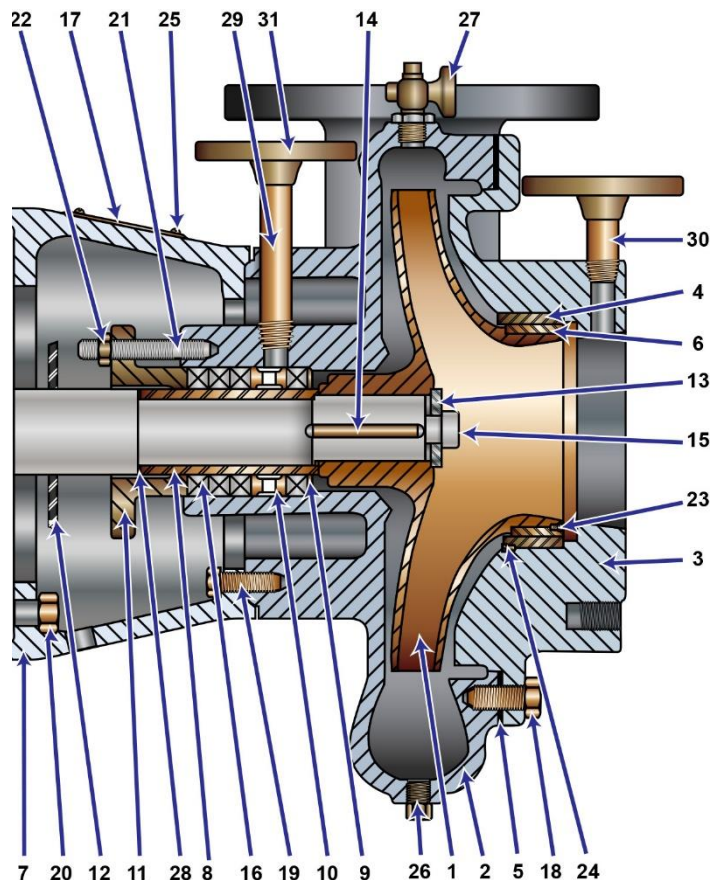
United States Coast Guard National Maritime Center



GS-0012

ITEM	QTY	DESCRIPTION	MATERIAL	REMARKS
1	1	Impeller	NI-CU Alloy	3H1A
2	1	Volute	Gunmetal	3H4C
3	1	Suction Cover	Gunmetal	3H193
4	1	Volute Wear Ring	Valve Bronze	A-3H180A
5	1	Volute Gasket	PTFE/ Glass Fiber Reinforced	P/N 3H37
6	1	Impeller Wear Ring	NI-CU Alloy	3H180
7	1	Motor Bracket	Cast Steel	2L3C
8	1	Shaft Sleeve	NI-CU Alloy	P/N A-014-20A-0-01
9	1	Throat Bushing	NI-CU Alloy	P/N 4L26-4
10	1	Lantern Ring	NI-CU Alloy	4L169
11	2	Gland Half	Bronze	B-017-5AH-A
12	1	Slinger	Neoprene	1 47/64 X 3 3/4 X 1/8TH
13	1	Impeller Washer	NI-CU Alloy	17/32 X 9/16 X 3/16TH
14	1	Impeller Key	NI-CU Alloy	1/4 SQ X 2 5/16 TH
15	1	SKT HD Capscrew	SST	1/2-13 NC X 1 1/4 LG NYLOCK
16	5	Packing Rings	Plastic Metallic	1 3/4 X 2 5/8 X 7/16 SQ
17	1	Name Plate	Brass	P/N A-226-00N-0-03
18	8	Hex Head Capscrews	NI-CU Alloy	1/2-13 NC X 1 LG
19	4	Hex Head Capscrews	NI-CU Alloy	3/8-16 x 1 LG
20	4	Hex Head Capscrews	NI-CU Alloy	1/2-13 NC X 1 1/4 LG
21	2	Stud	SST	3/8-16 NC X 2 1/2 LG
22	2	Hex Nut	Bronze	3/16-16 2
23	3	Setscrew	NI-CU Alloy	10-24 NC X 1/4 LG CUP
24	3	Setscrew	NI-CU Alloy	10-24 NC X 1/4 LG CUP
25	4	Drive Screw	Brass	6-24 X 1/4 LG
26	3	Pipe Plug	Bronze	1/4 NPT
27	1	Vent Valve	Bronze	1/4 NPT
28	1	O Ring	Buna "N"	1 5/16 ID 1/16 WIDE
29	1	Pipe	70-30 CU-NI	4 11/16 LG 1/4 NPT
30	1	Pipe	70-30 CU-NI	3 3/16 LG 1/4 NPT
31	1	Flange	Valve Bronze	1/4 INCH 150#

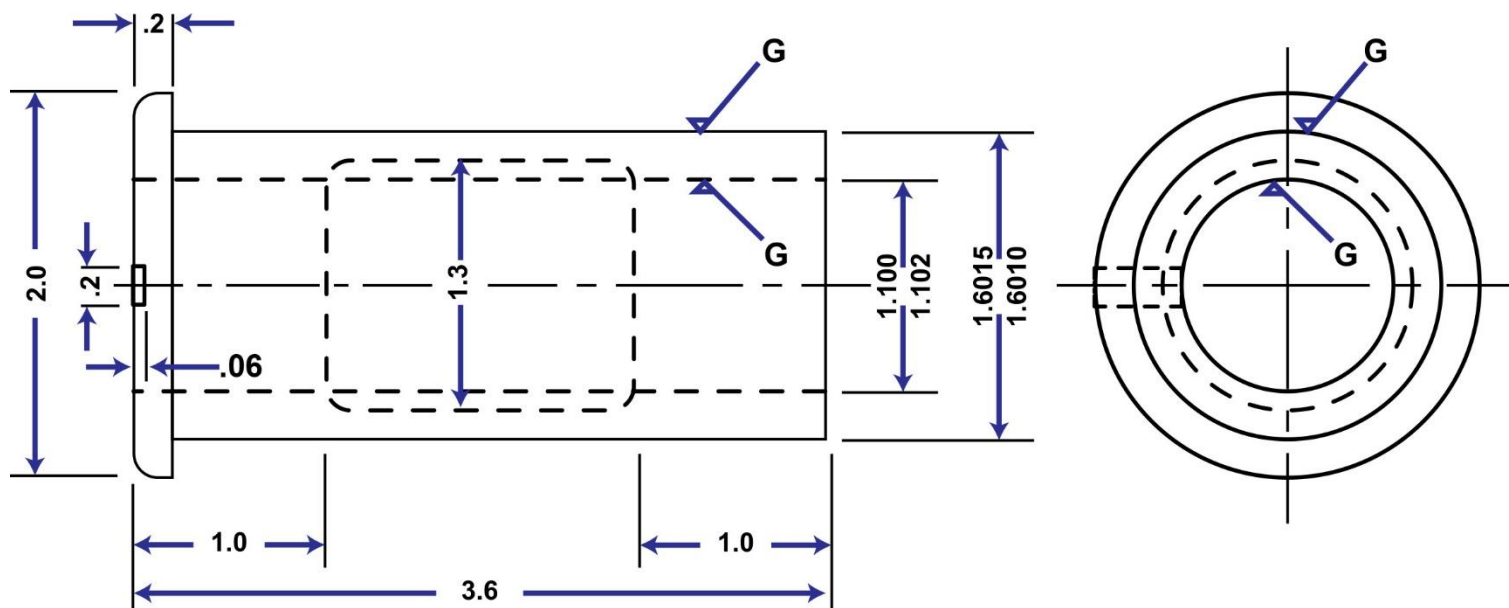
Note: Inside dia. of Wearing Ring, PC No. (4) is .020 undersize outside dia. of Wearing Ring, PC No. (6) is .020 oversize when finished as repair parts and are designated as part No. 5 A3H180A-1 U/S and 3H180-1 O/S



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GS-0017

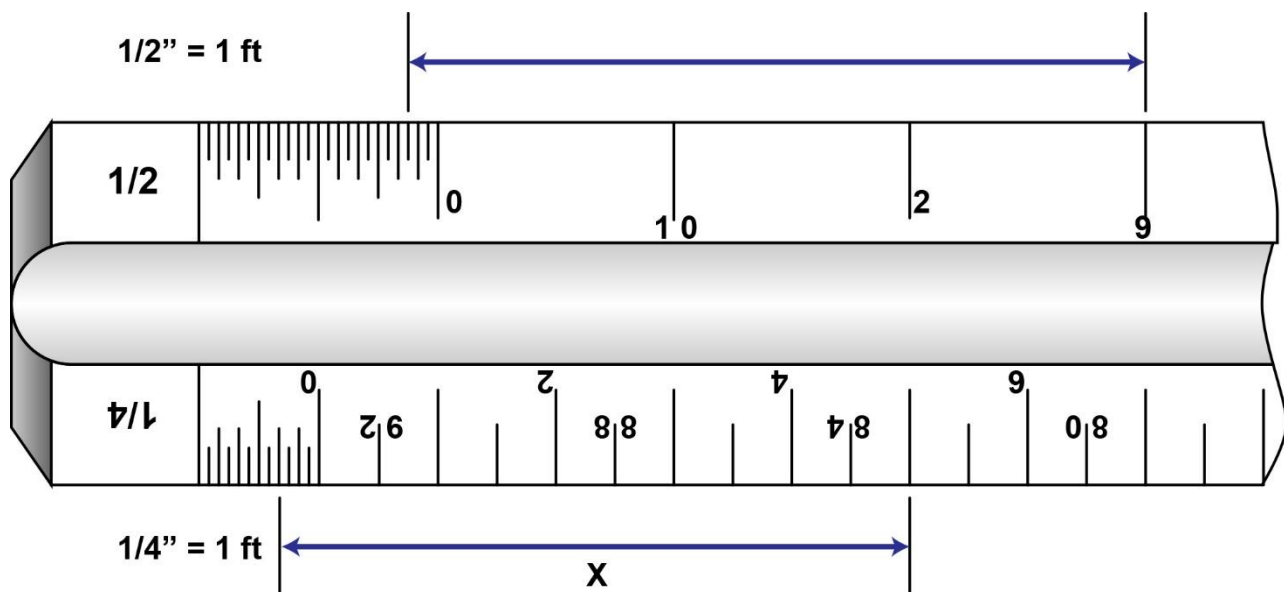


Bushing
AISI 1095 SAE Carbon Steel
Hardened and Tempered
Designated Surfaces Ground
To Specified Tolerances

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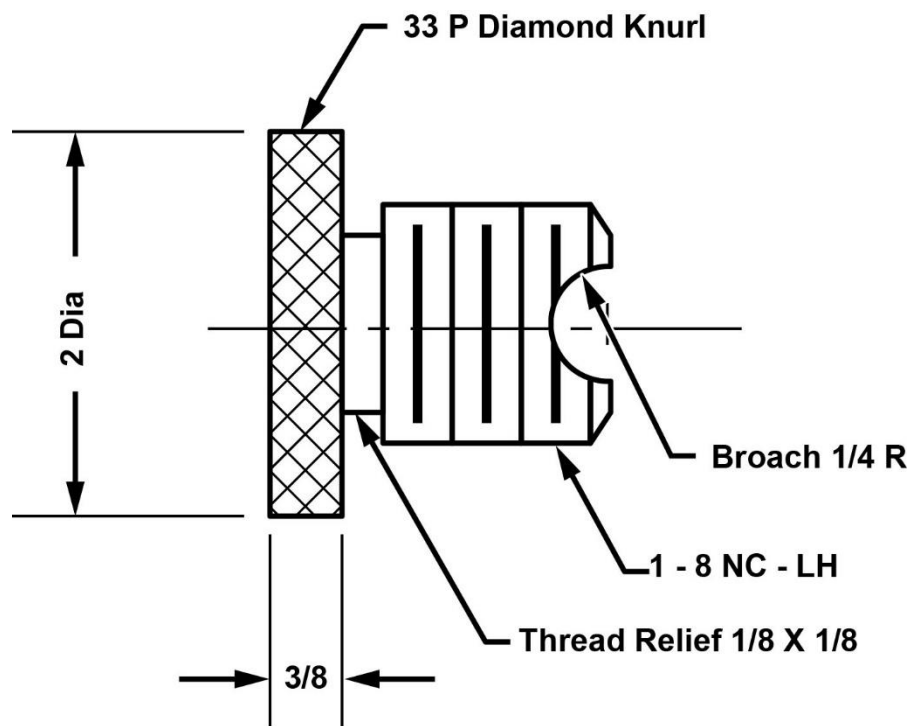
GS-0023



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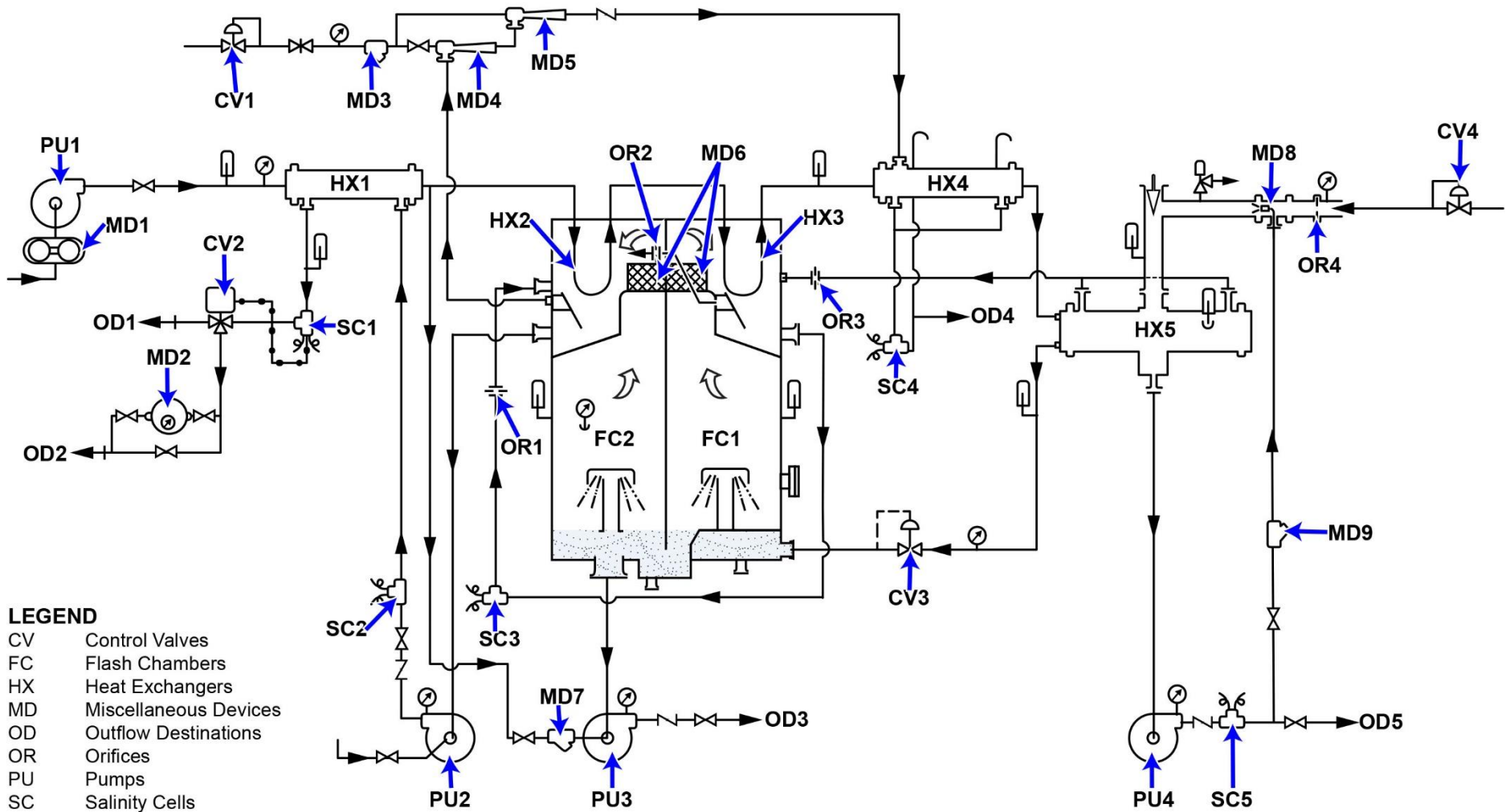
GS-0038



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GS-0053



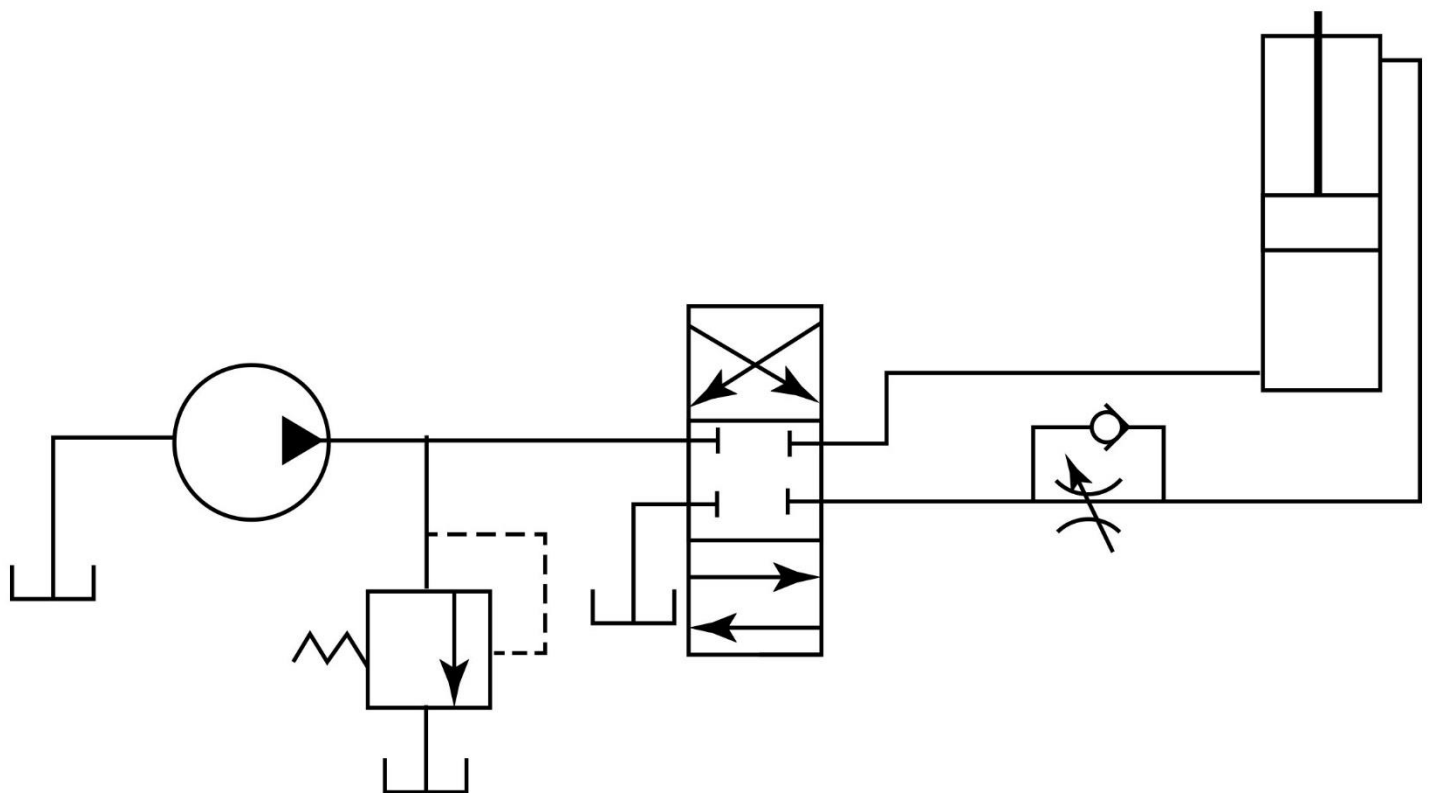
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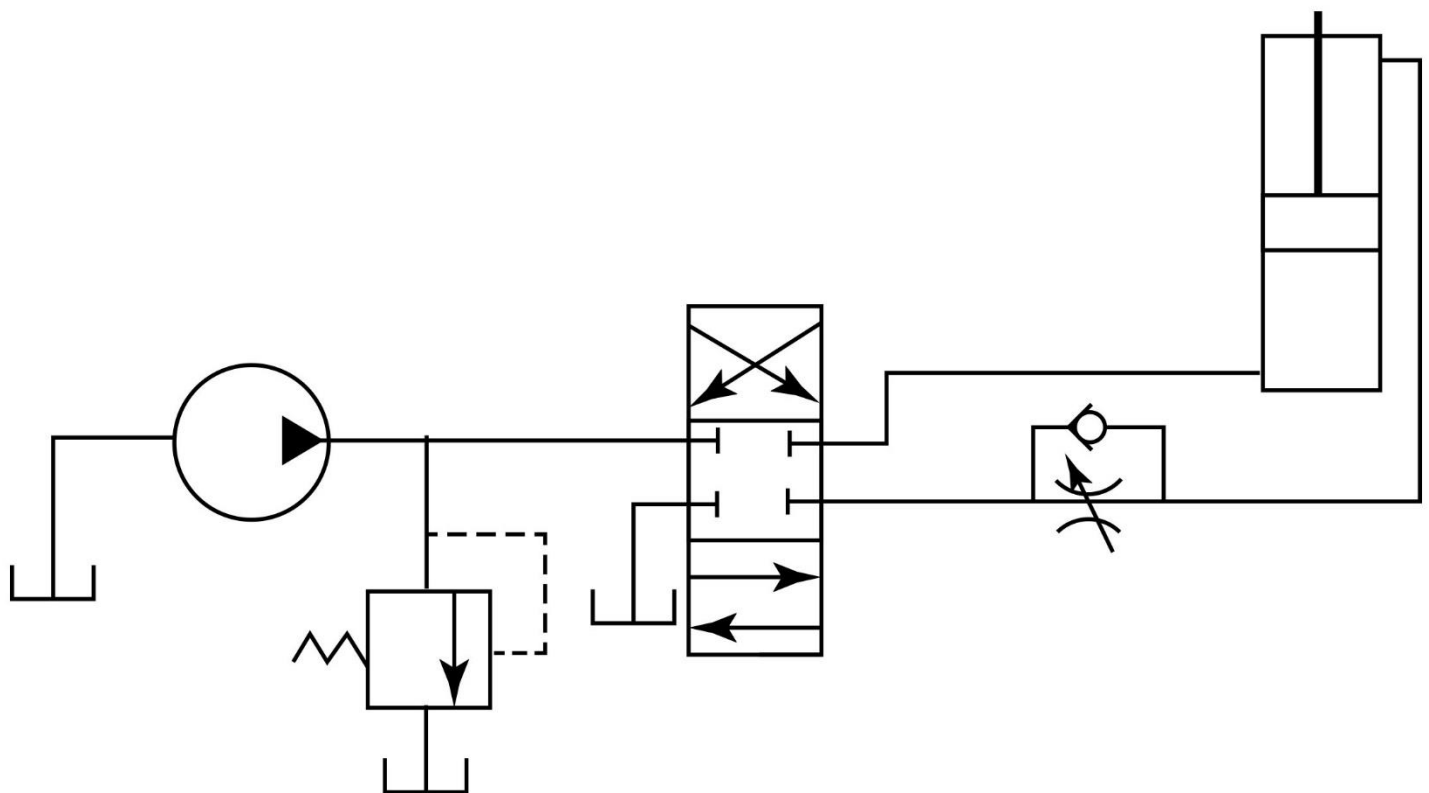
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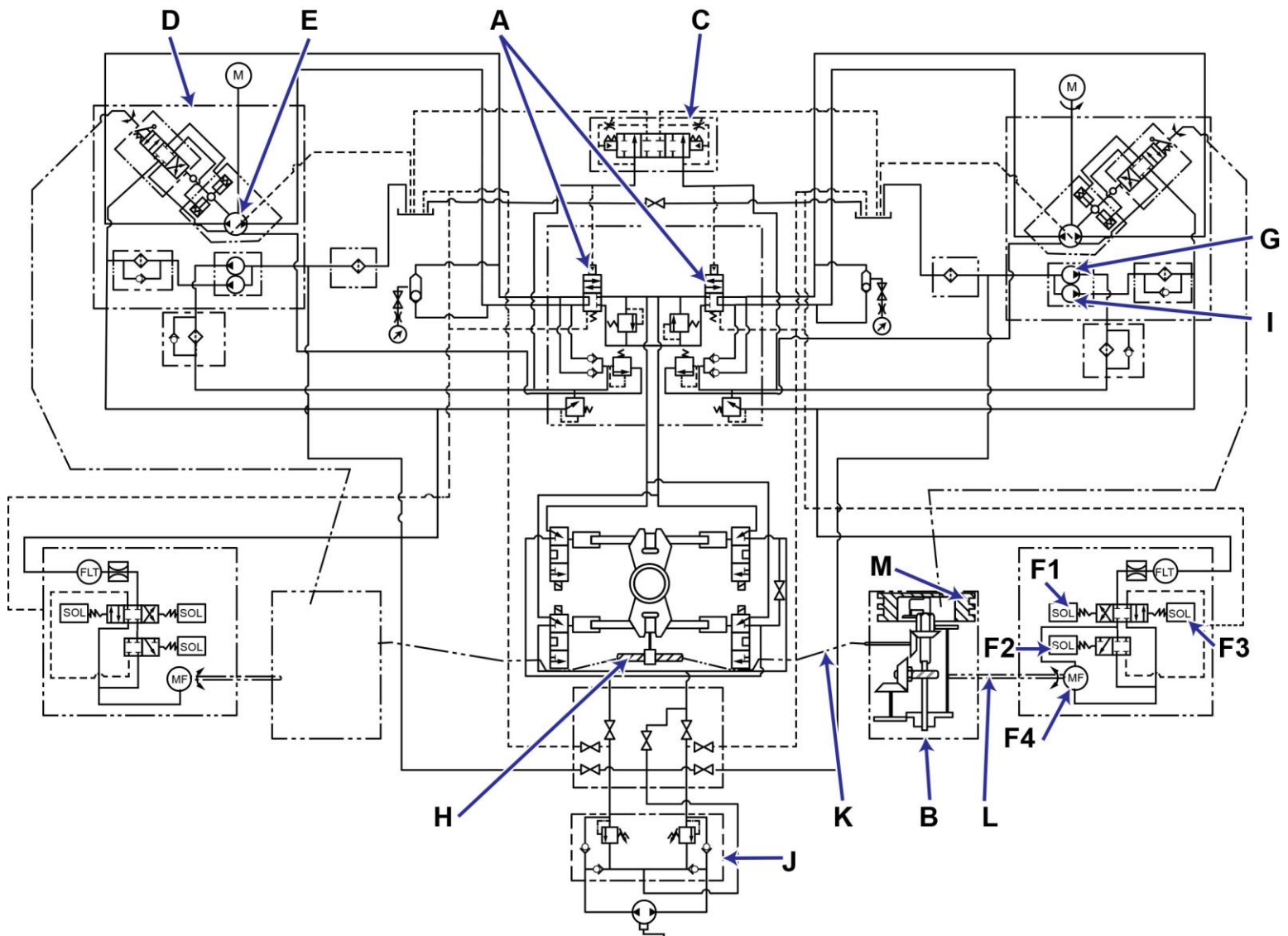
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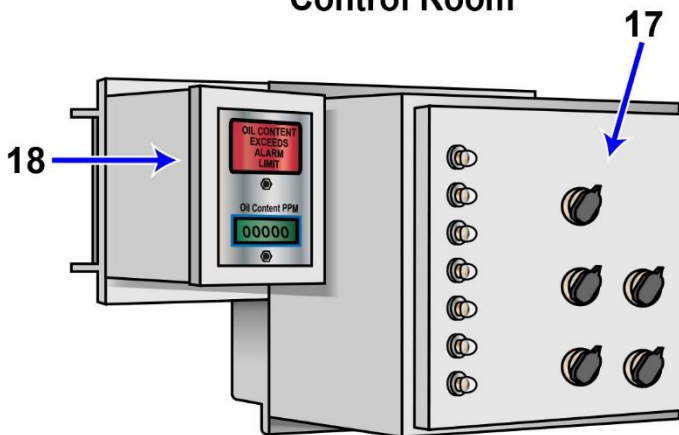


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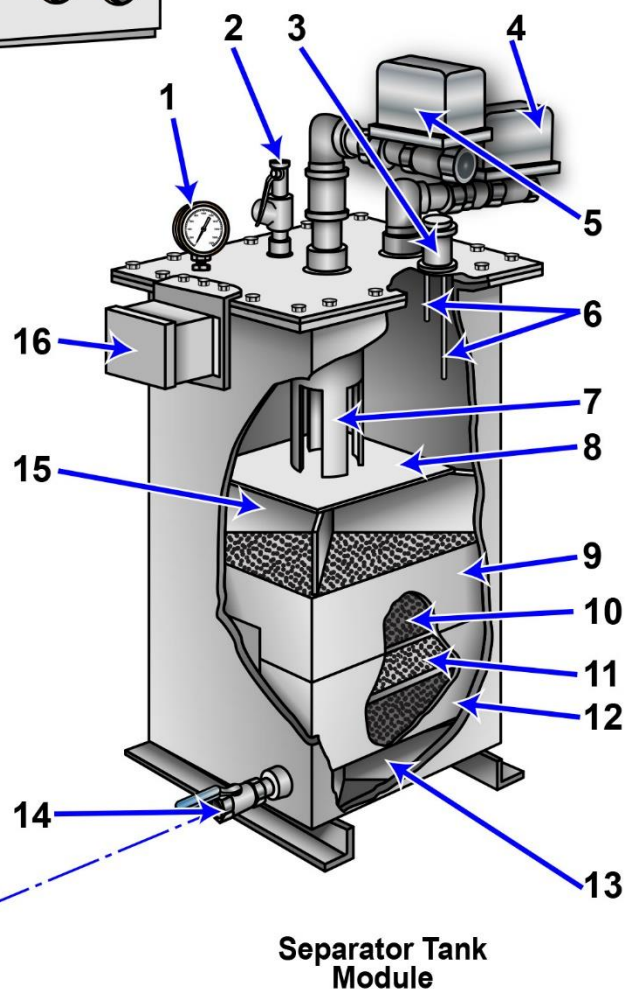
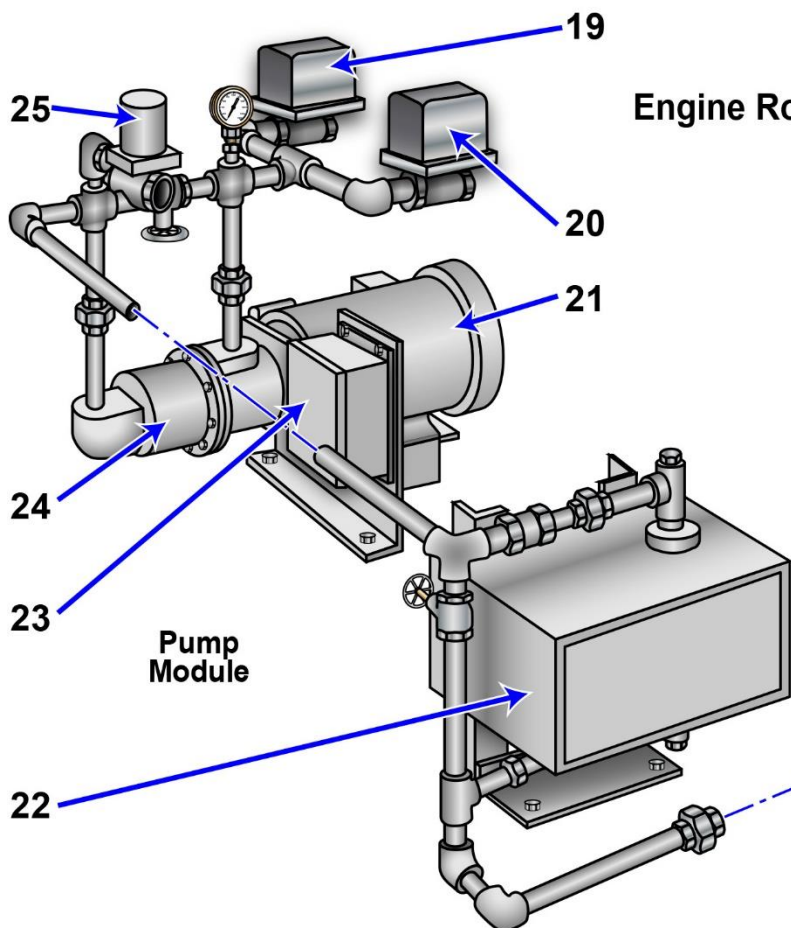


GS-0153

Control Room



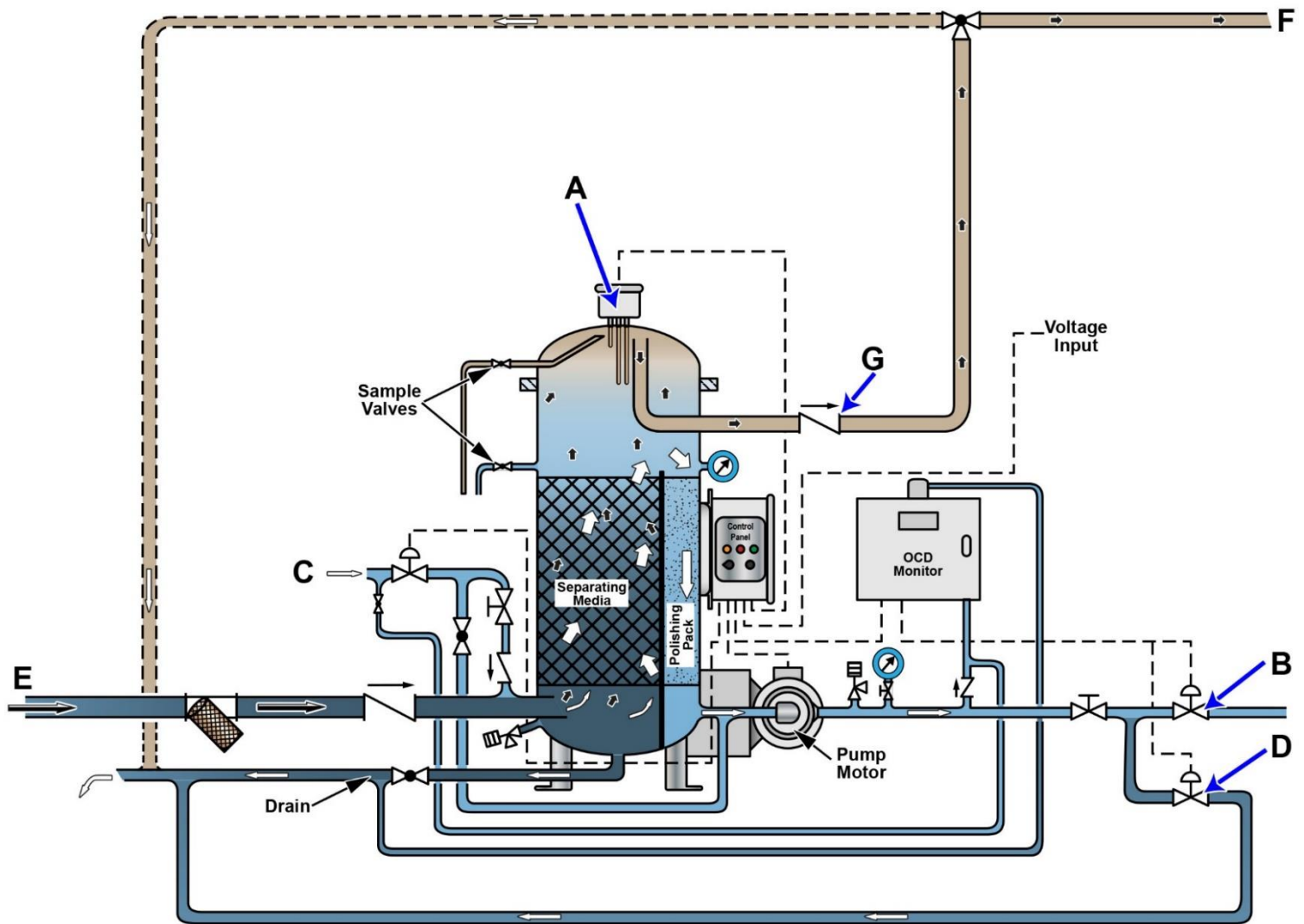
Engine Room



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

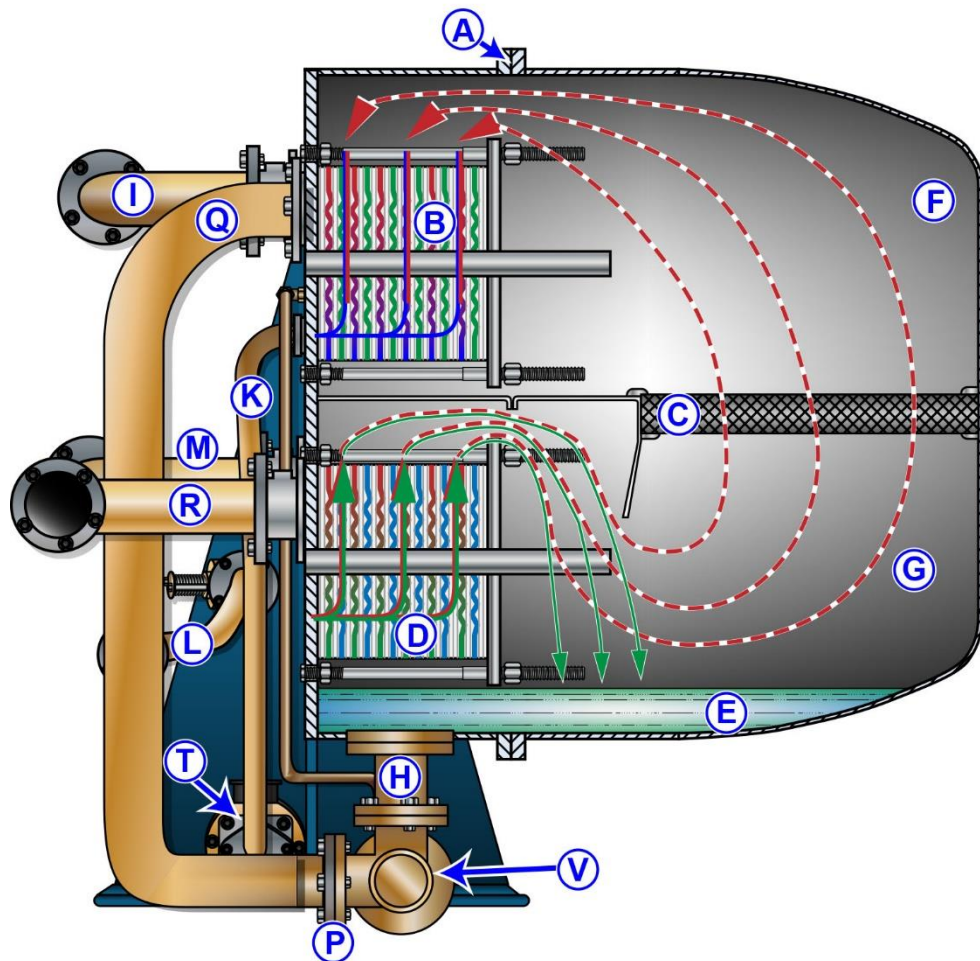


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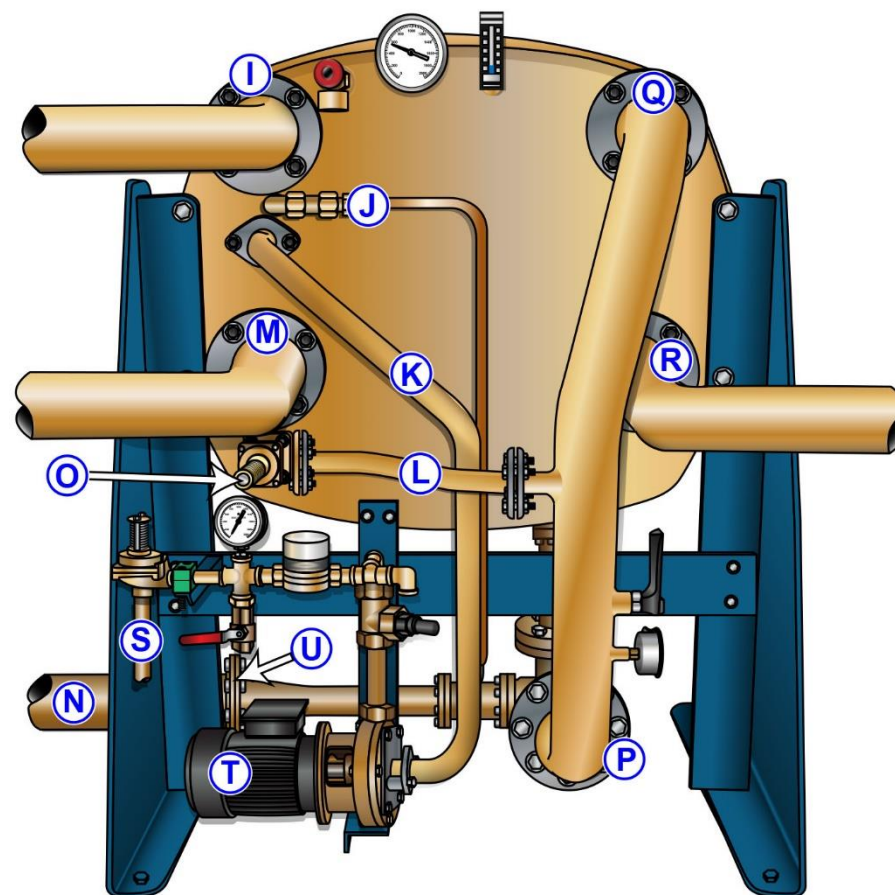


MO-0110

Side View



Rear View



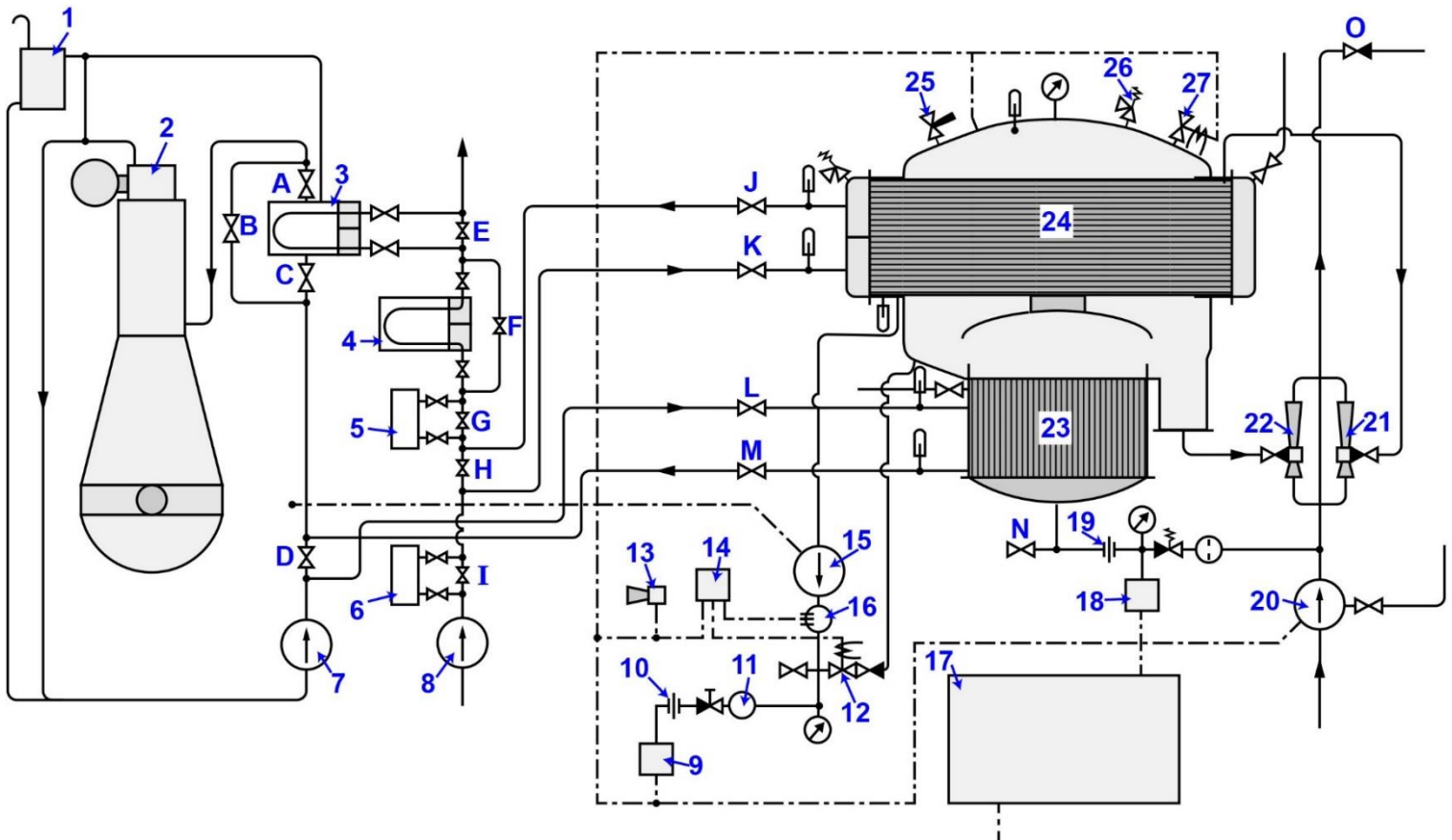
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MO-0111

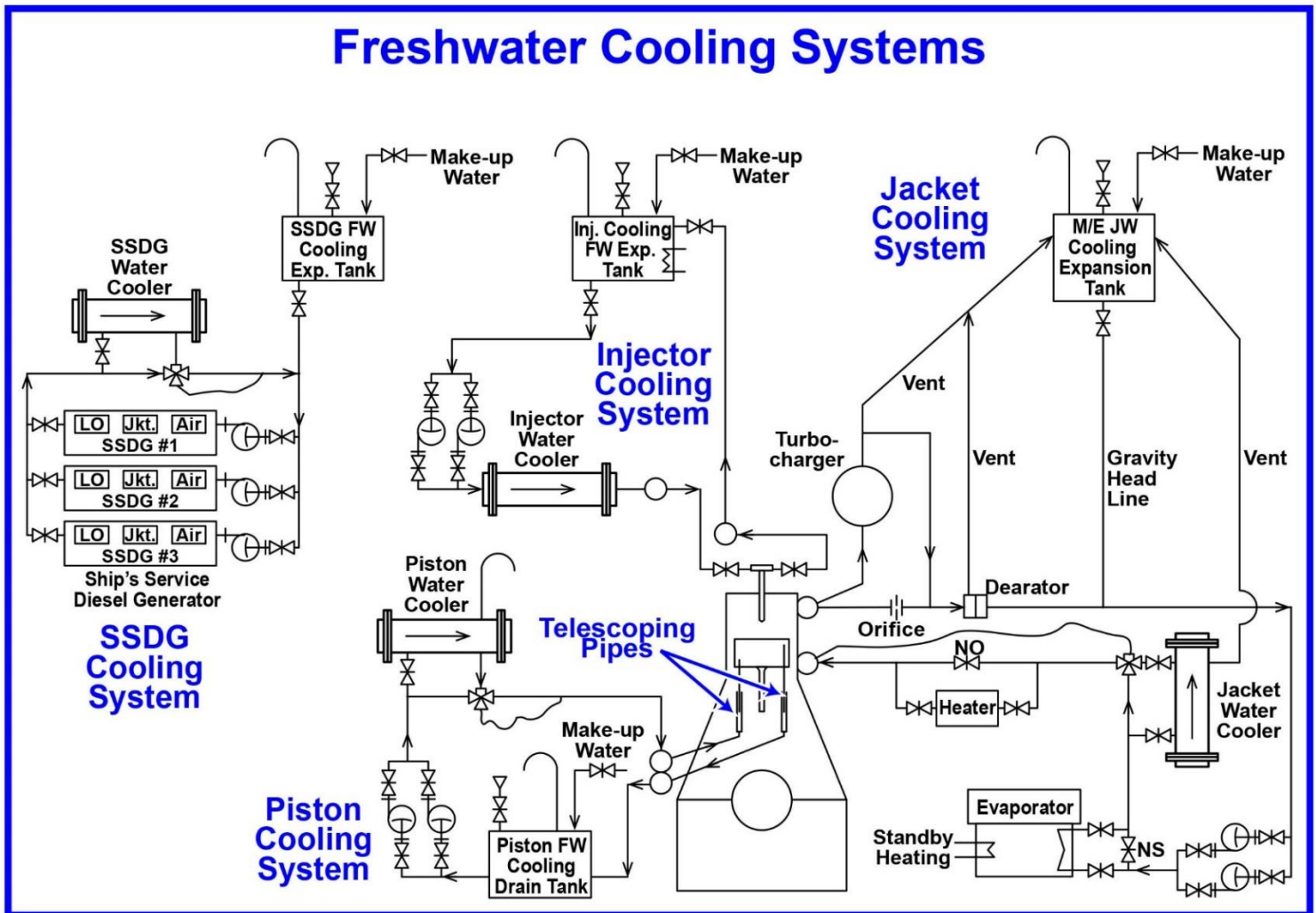


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MO-0212

Freshwater Cooling Systems



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