

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.** 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

*If choice D is selected set score to 1.*

**2.** 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) a ptfe/glass fiber reinforced gasket
- (D) compressing the packing rings

*If choice C is selected set score to 1.*

**3.** 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

*If choice A is selected set score to 1.*

**4.** The crosshatch design on the end of piece "3" in the illustration shown indicates that \_\_\_\_\_. Illustration GS-0020

- (A) the piece is screwed into piece No.2
- (B) the piece is made of mild carbon steel
- (C) piece No.3 is knurled in that area
- (D) piece No.3 is made of stainless steel

*If choice C is selected set score to 1.*

5. 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

*If choice B is selected set score to 1.*

6. Before doing any work on a hydraulic system equipped with accumulators, you should \_\_\_\_\_ .

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

*If choice D is selected set score to 1.*

7. New piping and tubing to be installed in a hydraulic system can be safely degreased by using \_\_\_\_\_ .

- (A) alcohol
- (B) a water-based detergent
- (C) a special petroleum solvent
- (D) carbon tetrachloride

*If choice C is selected set score to 1.*

8. Lint from cleaning rags can be harmful to hydraulic systems because the lint \_\_\_\_\_ .

- (A) can clog filters and promote component leakage
- (B) can cause rusting of internal parts
- (C) breaks down hydraulic fluid
- (D) solidifies and causes cracked lines

*If choice A is selected set score to 1.*

9. 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) be successful every time
- (C) find that the pressure will prevent the components from being tightened
- (D) cause the system to vibrate

*If choice C is selected set score to 1.*

- 10.** 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.

*If choice A is selected set score to 1.*

- 11.** You are unable to pump out the aft starboard engine room bilge well that is fouled, with one foot of water over the top of the bilge well, what action should be carried out?
- (A) Simultaneously operate all available bilge pumps.
  - (B) Send the wiper into the well with only a scoop and pail.
  - (C) Remove the bilge manifold valve and attempt to back flush the line.
  - (D) It is only necessary to transfer half the contents of a drum of degreaser into the bilge well.

*If choice C is selected set score to 1.*

- 12.** 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.

*If choice C is selected set score to 1.*

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

*If choice C is selected set score to 1.*

**14.** When the oily-water separator, shown in the illustration, is in operation and processing clear bilge water, what should be the internal water level? Illustration GS-0153

- (A) The water level should be located in the upper section of the tank.
- (B) The water level should be located in the lower section of the tank as controlled by flow control valve "14".
- (C) The water level in the tank should be slightly above the upper coalescer bed "9".
- (D) No water level is maintained in the tank.

*If choice A is selected set score to 1.*

**15.** The function of item "7" shown in the illustration is to \_\_\_\_\_. Illustration GS-0153

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

*If choice A is selected set score to 1.*

**16.** The line labeled "C", as shown in the illustration, would be identified as the \_\_\_\_\_. Illustration GS-0175

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

*If choice A is selected set score to 1.*

**17.** The process of grinding, shredding, or reducing the size of sewage particles is known as \_\_\_\_\_.

- (A) detention
- (B) maceration
- (C) bulking
- (D) chlorinating

*If choice B is selected set score to 1.*

**18.** 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

*If choice C is selected set score to 1.*

**19.** 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

*If choice A is selected set score to 1.*

**20.** On most commercial cargo vessels with a relatively small crew size and few users of the potable water system, how is the potable water system pressure maintained?

- (A) Allowing the potable water pump to run continuously against a shut-off head during periods of zero demand for potable water.
- (B) Cycling the potable water pump on and off by the action of potable water storage tank level switches in response to system demand changes.
- (C) Cycling the potable water pump on and off by the action of the potable water hydropneumatic tank pressure switch in response to system demand changes.
- (D) Allowing the potable water pump to run continuously while recirculating during periods of zero demand for potable water.

*If choice C is selected set score to 1.*

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

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

*If choice D is selected set score to 1.*

**22.** 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.*

- 23.** 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.

*If choice C is selected set score to 1.*

- 24.** 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 hotter 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 cooler 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.

*If choice C is selected set score to 1.*

- 25.** In a closed-loop process control system, what is meant by gain?
- (A) The progressive reduction or suppression of oscillation in a component.
  - (B) The signal in a controller that is obtained by subtracting the measured value of the controlled value from the setpoint.
  - (C) The undesirable characteristic in which the error of a control system oscillates with constant or increasing amplitude.
  - (D) The ratio of the amplitude of the output signal of a component divided by the amplitude of the input signal.

*If choice D is selected set score to 1.*

- 26.** In a closed-loop process control system, what term is used to describe the progressive reduction or suppression of oscillation in a component?
- (A) Saturation
  - (B) Damping
  - (C) Hysteresis
  - (D) Deadband

*If choice B is selected set score to 1.*

**27.** 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 accumulation of error over time.
- (B) It is a control mode that produces a control action that is proportional to the error.
- (C) It is a control mode that produces a control action that is proportional to the gain.
- (D) It is a control mode that produces a control action that is proportional to the rate at which the error is changing.

*If choice D is selected set score to 1.*

**28.** In a closed-loop process control system, what is meant by the integral mode of control?

- (A) It is a control mode that produces a control action that is proportional to the gain.
- (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 error.
- (D) It is a control mode that produces a control action that is proportional to the rate at which the error is changing.

*If choice B is selected set score to 1.*

**29.** 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) Cycloidal propeller
- (C) Contra-rotating propeller
- (D) Helicoidal propeller

*If choice B is selected set score to 1.*

**30.** When an electricity generating plant features shaft-driven generators, what type of propulsor is generally used for main propulsion?

- (A) Tandem propellers
- (B) Controllable-pitch propeller
- (C) Detachable-blade (built-up) propeller
- (D) Fixed-pitch propeller

*If choice B is selected set score to 1.*



**31.** 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) Cycloidal propeller
- (C) Azipod propulsor
- (D) Jet drive

*If choice C is selected set score to 1.*

**32.** With respect to a "tractor" type azimuthing thruster, what statement is true?

- (A) With an azimuthing angle of  $0^\circ$ , the gear unit is directly abaft of and in the wake of the azimuthing thruster's propeller.
- (B) With an azimuthing angle of  $0^\circ$ , the azimuthing thruster's propeller is directly abaft of and in the wake of the gear unit.
- (C) With an azimuthing angle of  $0^\circ$ , 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.
- (D) With an azimuthing angle of  $0^\circ$ , 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.

*If choice A is selected set score to 1.*

**33.** What type of propulsor is typically used in electric motor driven, transverse, tunnel bow thrusters to limit the starting current of the single speed drive motor?

- (A) Fixed-pitch propeller
- (B) Detachable-blade (built-up) propeller
- (C) Cycloidal propeller
- (D) Controllable-pitch propeller

*If choice D is selected set score to 1.*

**34.** Which of the following couplings or clutches would be able to prevent the transmission of torsional vibrations from an engine to a reduction gear?

- (A) Inflatable tire-type pneumatic clutch
- (B) Hydraulic fluid-type clutch
- (C) Multiple disk friction clutch
- (D) Solid coupling

*If choice B is selected set score to 1.*

**35.** For a parallel axis single reduction gear, what statement is true?

- (A) The drive pinion is the smaller of the two gears and rotates at a relatively high speed. The driven gear is the larger of the two gears and rotates at a relatively low speed.
- (B) The drive pinion is the smaller of the two gears and rotates at a relatively low speed. The driven gear is the larger of the two gears and rotates at a relatively high speed.
- (C) The drive pinion is the larger of the two gears and rotates at a relatively high speed. The driven gear is the smaller of the two gears and rotates at a relatively low speed.
- (D) The drive pinion is the larger of the two gears and rotates at a relatively low speed. The driven gear is the smaller of the two gears and rotates at a relatively high speed.

*If choice A is selected set score to 1.*

**36.** 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) Stern tube shaft
- (C) Thrust shaft
- (D) Line shaft

*If choice B is selected set score to 1.*

**37.** 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 split half pedestal type bearing housings.
- (C) Line shaft bearing housings are typically single-piece flange type bearing housings.
- (D) Line shaft bearing housings are typically split half flange type bearing housings.

*If choice B is selected set score to 1.*

**38.** Which of the listed problems could produce a high absolute pressure within a flash type evaporator?

- (A) production of high salinity distillate
- (B) a leak in the first stage demister
- (C) seawater feed temperature below 165°F
- (D) a cracked distillate pump vent line

*If choice D is selected set score to 1.*

**39.** Irregular feeding or surging of the feedwater supply to a flash evaporator may be attributed to \_\_\_\_\_.

- (A) a clogged vent line from the air eductor condenser
- (B) erratic water flow through the air eductor
- (C) excessive pressure in the sea water feed heater
- (D) a dirty strainer in the saltwater feed pump suction line

*If choice D is selected set score to 1.*

**40.** While the illustrated system is operated using the steam supply through "OR4" the strainer "MD9" becomes fouled, this will result in \_\_\_\_\_. Illustration GS-0053

- (A) "PU4" becoming vapor bound
- (B) the temperature regulated by "CV3" difficult to maintain
- (C) nothing unusual for the type of operation indicated as this line was unnecessary in the installation
- (D) a reduction in distillate production

*If choice D is selected set score to 1.*

**41.** Which of the following conditions can cause high salinity of the distillate due to sea water leakage in the illustrated device? Illustration MO-0110

- (A) Improper venting during start-up.
- (B) Improper venting during operation.
- (C) Failure to properly tighten the bolts of the evaporator heat exchanger.
- (D) Failure to properly tighten the bolts of the condenser heat exchanger.

*If choice D is selected set score to 1.*

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

*If choice A is selected set score to 1.*

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

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

*If choice B is selected set score to 1.*

**44.** With regards to a reverse osmosis unit, what is the BEST indication that the membrane module is damaged and is no longer semi-permeable and allowing the solute to pass through?

- (A) Higher than normal brine overboard back pressure.
- (B) Lower than normal fresh water production.
- (C) High fresh water outlet salinity.
- (D) Low fresh water outlet salinity.

*If choice C is selected set score to 1.*

**45.** If a reverse-osmosis freshwater generator has fouled membrane modules, what statement is true?

- (A) The freshwater production rate would be lower than normal, and the feed pressure would be higher than normal.
- (B) The freshwater production rate would be higher than normal, and the feed pressure would be lower than normal.
- (C) The freshwater production rate would be lower than normal, and the feed pressure would be lower than normal.
- (D) The freshwater production rate would be higher than normal, and the feed pressure would be higher than normal.

*If choice A is selected set score to 1.*

**46.** The instrument always used in conjunction with a salinometer is a \_\_\_\_\_.

- (A) thermometer
- (B) hydrometer
- (C) hygrometer
- (D) pyrometer

*If choice A is selected set score to 1.*

**47.** In a flash-type evaporator, an electrical salinity cell would be installed in the \_\_\_\_\_.

- (A) condensate drains from the distiller feedwater heater
- (B) distillate inlet to the distillate cooler
- (C) distillate outlet from the distillate cooler
- (D) all of the above

*If choice D is selected set score to 1.*

**48.** What provision is made for sea chests for removal of air ingested into the sea chest of a machinery space sea water cooling system?

- (A) The air may be continuously removed by an open valve located in the drain line originating from the bottom of the sea chest and terminating above the deep-draft load line.
- (B) The air may be continuously removed by an open valve located in the drain line originating from the bottom of the sea chest and terminating in the bilges.
- (C) The air may be continuously removed by an open valve located in the vent line originating from the top of the sea chest and terminating above the deep-draft load line.
- (D) The air may be continuously removed by an open valve located in the vent line originating from the top of the sea chest and terminating in the bilges.

*If choice C is selected set score to 1.*

**49.** Referring to the illustrated motor ship fresh water cooling system drawing, which cooling system has cooling water passing through passages within components that are continuously undergoing motion? Illustration MO-0212

- (A) The main engine jacket water cooling system.
- (B) The main engine injector cooling water system.
- (C) The main engine piston cooling water system.
- (D) The SSDG cooling water systems

*If choice C is selected set score to 1.*

**50.** On deep-draft ships, what statement is true concerning high and low sea suction for machinery space sea water cooling systems?

- (A) 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.
- (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 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.
- (D) 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.

*If choice D is selected set score to 1.*

**51.** A hydraulic fluid flow control circuit, controlling linear actuator speed, with the pump operating below maximum operating pressure is known as the \_\_\_\_\_.

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

*If choice C is selected set score to 1.*

**52.** Assuming valve "A" is correctly aligned in the no-flow position as shown with the system in operation, which of the following statements is true? Illustration GS-0049

- (A) Valve "B" would be open before valve "D".
- (B) Valve "D" would normally open before valve "B".
- (C) Valve "C" would be closed.
- (D) The fixed delivery pump would be stopped automatically by a pressure switch.

*If choice B is selected set score to 1.*

**53.** A hydraulic system flow control circuit is shown in the illustration and is known as a \_\_\_\_\_. Illustration GS-0105

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

*If choice C is selected set score to 1.*

**54.** 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"

*If choice A is selected set score to 1.*

**55.** 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

*If choice A is selected set score to 1.*

**56.** The action necessary to use the steering gear room trick wheel when transferring the steering control from the wheelhouse to local control, is to \_\_\_\_\_.

- (A) align the trick wheel to the rudder angle position before engaging
- (B) set the six-way control valve in the trick wheel position
- (C) open the power transfer switch before engaging the trick wheel
- (D) always place the rudder in the amidships position to engage the trick wheel

*If choice A is selected set score to 1.*

**57.** 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 windlass clutch control levers?

- (A) The clutch control levers are used to engage and disengage the wildcats only. They have no control over the warping heads.
- (B) The clutch control levers are used to engage and disengage either the warping heads or the wildcats, depending upon the windlass design.
- (C) The clutch control levers are used to engage and disengage both the warping heads and the wildcats.
- (D) The clutch control levers are used to engage and disengage the warping heads only. They have no control over the wildcats.

*If choice A is selected set score to 1.*

**58.** 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 warping heads 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 the wildcats only.
- (D) The manual brake handwheels control band brakes that are associated with either the wildcats or the warping heads, depending upon the windlass design.

*If choice C is selected set score to 1.*

**59.** 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 the hydraulic pump stroke control being in other than the neutral position.
- (B) Failure to start could be the result of an electrical interlock associated with the hydraulic pump stroke control being in 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 handwheel operated wildcat band brakes being set.

*If choice A is selected set score to 1.*

**60.** 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 hung from the underside of 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 are mounted on the deck below the weather deck, and only the capstan head is located on the weather deck.
- (C) The drive arrangement where the drive motor, electric brake, gear reducer, and capstan head are all located on the weather deck.
- (D) A flexible coupling is required on all three drive arrangements listed above.

*If choice B is selected set score to 1.*

**61.** 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 over-ride elevator emergency status in a shipboard emergency when elevators are required to be used.
- (B) 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.
- (C) 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.
- (D) Door interlocks are used to prevent elevator operation in a shipboard emergency when elevators are not to be used.

*If choice C is selected set score to 1.*



**62.** As it pertains to the hoist motion limits associated with an electro-hydraulic cargo-handling pedestal-type deck crane, which statement is true?

- (A) When the boom is raised to a maximum permissible height or lowered to a minimum permissible height, the hoist pump shall be stroked to zero and the hoist winch brake set.
- (B) When the hoist cable is payed out to a nearly empty drum condition or when the hoist block is raised to a maximum permissible height relative to the boom, the hoist pump shall be stroked to zero and the hoist winch brake set.
- (C) When the hoist cable is payed out to a nearly empty drum condition or when the hoist block is raised to a maximum permissible height relative to the boom, the hoist pump shall be placed on stroke and the hoist winch brake released.
- (D) When the boom is raised to a maximum permissible height or lowered to a minimum permissible height, the hoist pump shall be placed on stroke and the hoist winch brake released.

*If choice B is selected set score to 1.*

**63.** Antifriction bearings can be removed undamaged from a shaft by using an arbor press, or wheel puller with a \_\_\_\_\_.

- (A) split washer or backup ring
- (B) ring gage
- (C) jack screw
- (D) split die

*If choice A is selected set score to 1.*

**64.** Which of the following statements best describes the filtering ability of a fine mesh metal lube oil strainer?

- (A) A 200 mesh screen has larger wires than a 100 mesh screen.
- (B) A 100 wire mesh screen will prevent passage of smaller particles than a 200 wire mesh screen.
- (C) A 200 wire mesh screen and a 100 wire mesh screen both prevent passage of the same size particles, but each allows a different number of particles to pass through.
- (D) A 200 wire mesh screen will prevent passage of smaller particles than a 100 wire mesh screen.

*If choice D is selected set score to 1.*

**65.** The greatest difference between absorbent and adsorbent filters is that absorbent filters \_\_\_\_\_.

- (A) soak up liquid contaminants directly into the filter media
- (B) attract or have liquid contaminants stick to the surface of the filter media
- (C) do not create pressure drops in the lube oil system
- (D) will remove additives from the lube oil

*If choice A is selected set score to 1.*

**66.** If dirt is allowed to contaminate the sump of a hydraulic deck crane, which of the following problems will occur?

- (A) The sheathing on the hydraulic lines will fracture.
- (B) The internal parts of the pump and hydraulic motor will wear excessively.
- (C) All the seals in the hydraulic lines will immediately blow out.
- (D) The lifting capacity of the crane will be immediately reduced by 70%.

*If choice B is selected set score to 1.*

**67.** A gradual decrease in the discharge pressure of an operating hydraulic pump can be caused by \_\_\_\_\_.

- (A) cold hydraulic fluid
- (B) the bleeder valve sticking in the open position
- (C) the four-way control valve failing to shift
- (D) a clogged air vent filter on the oil reservoir

*If choice D is selected set score to 1.*

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

*If choice C is selected set score to 1.*

**69.** 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.

*If choice D is selected set score to 1.*

**70.** Which term represents the ability of a speed control governor to maintain prime mover speed without hunting?

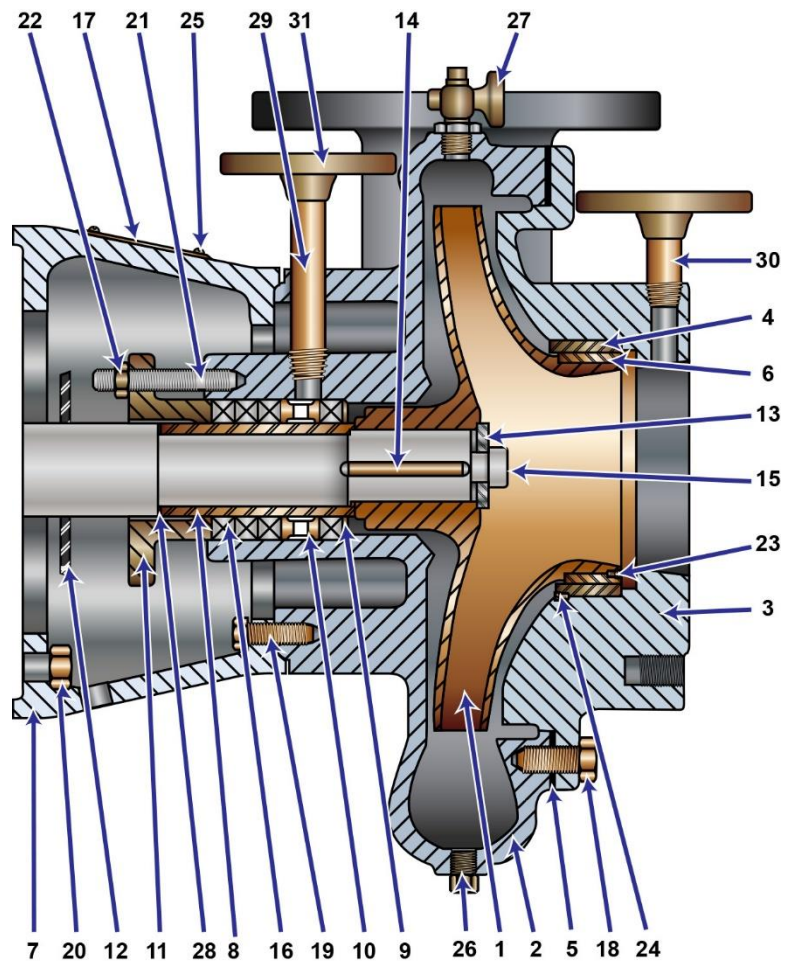
- (A) Sensitivity
- (B) Promptness
- (C) Dead band
- (D) Stability

*If choice D is selected set score to 1.*

## 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#

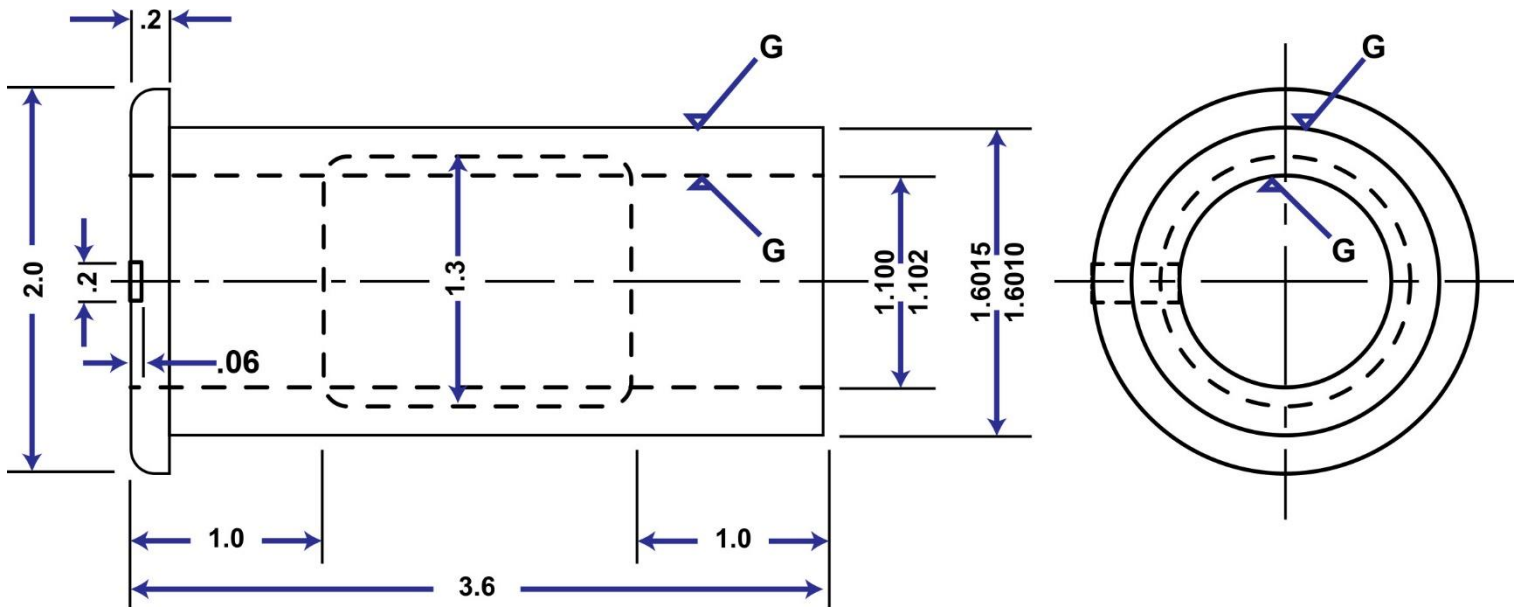
**Note:** Inside dia. of Wearing Ring, PC No. (4) is .020 undersize outside dia. of Wearing Ring, PC No. (6) is .020 oversize when finished as repair parts and are designated as part No. 5 A3H180A-1 U/S and 3H180-1 O/S



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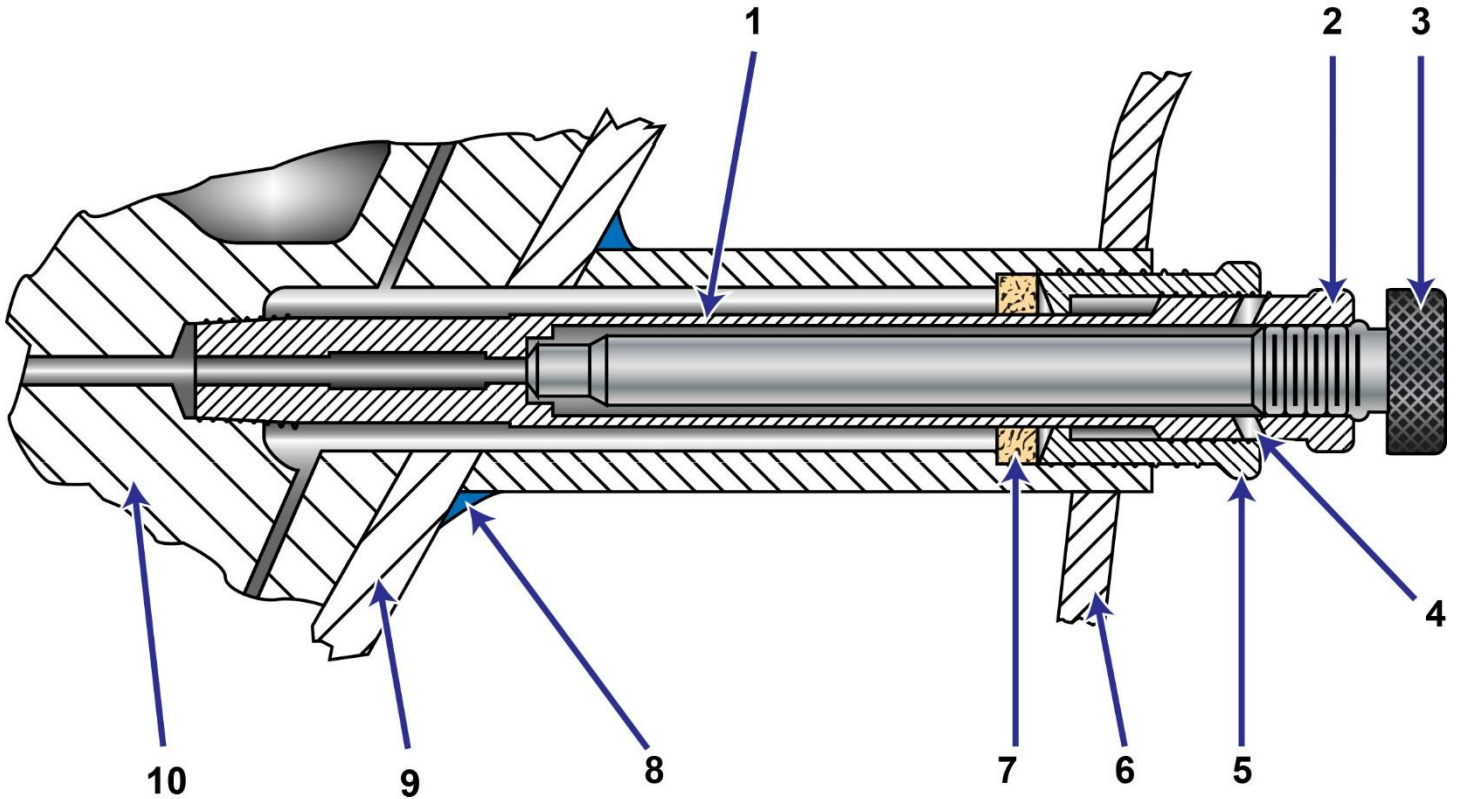
## GS-0017



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

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## GS-0020

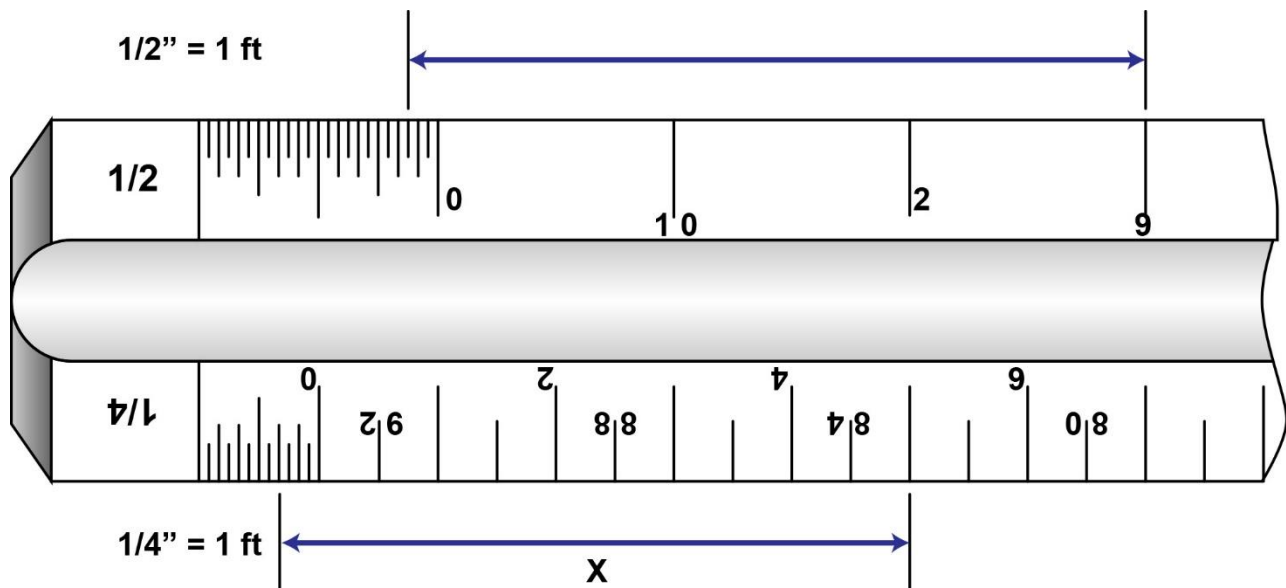


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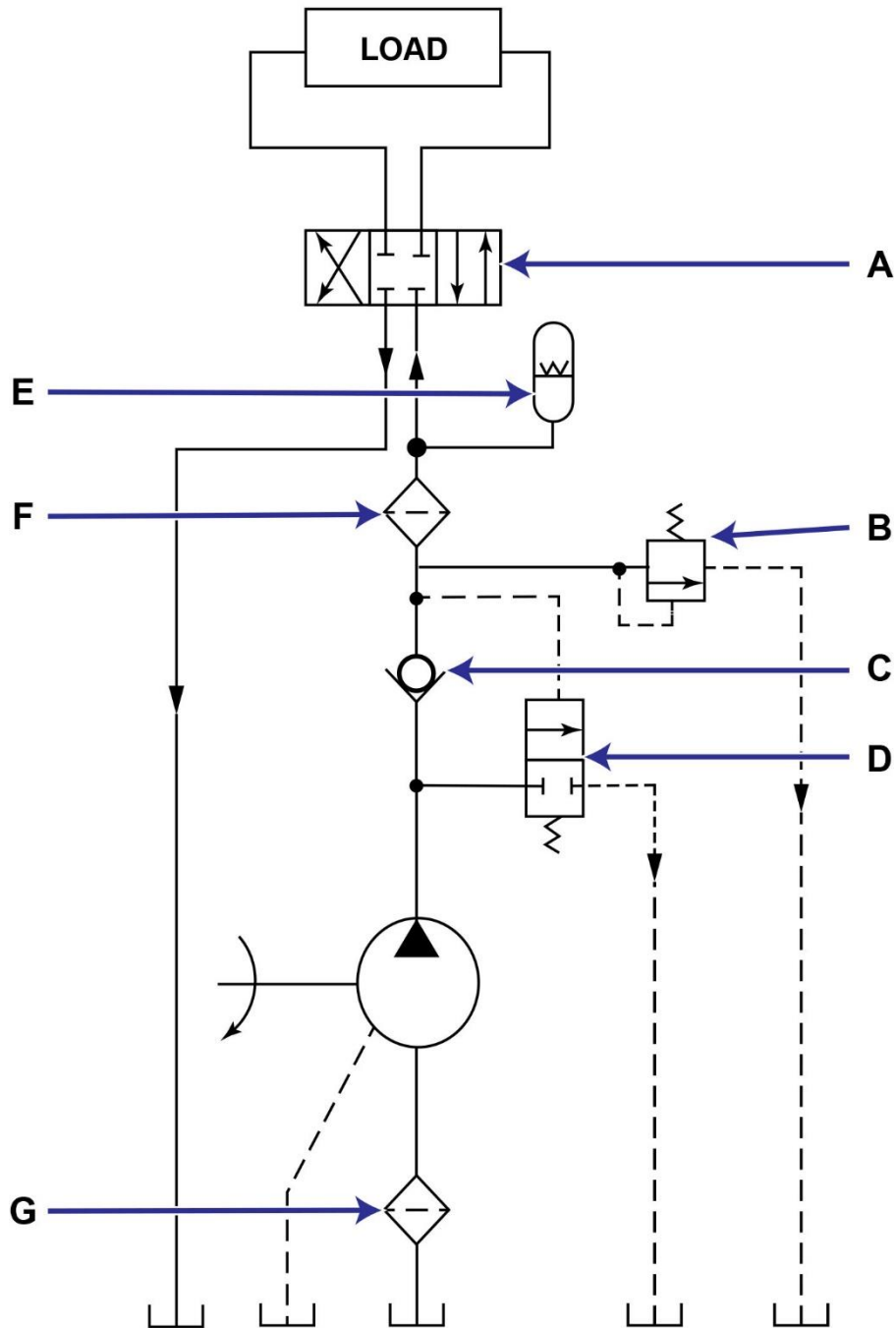
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## GS-0023



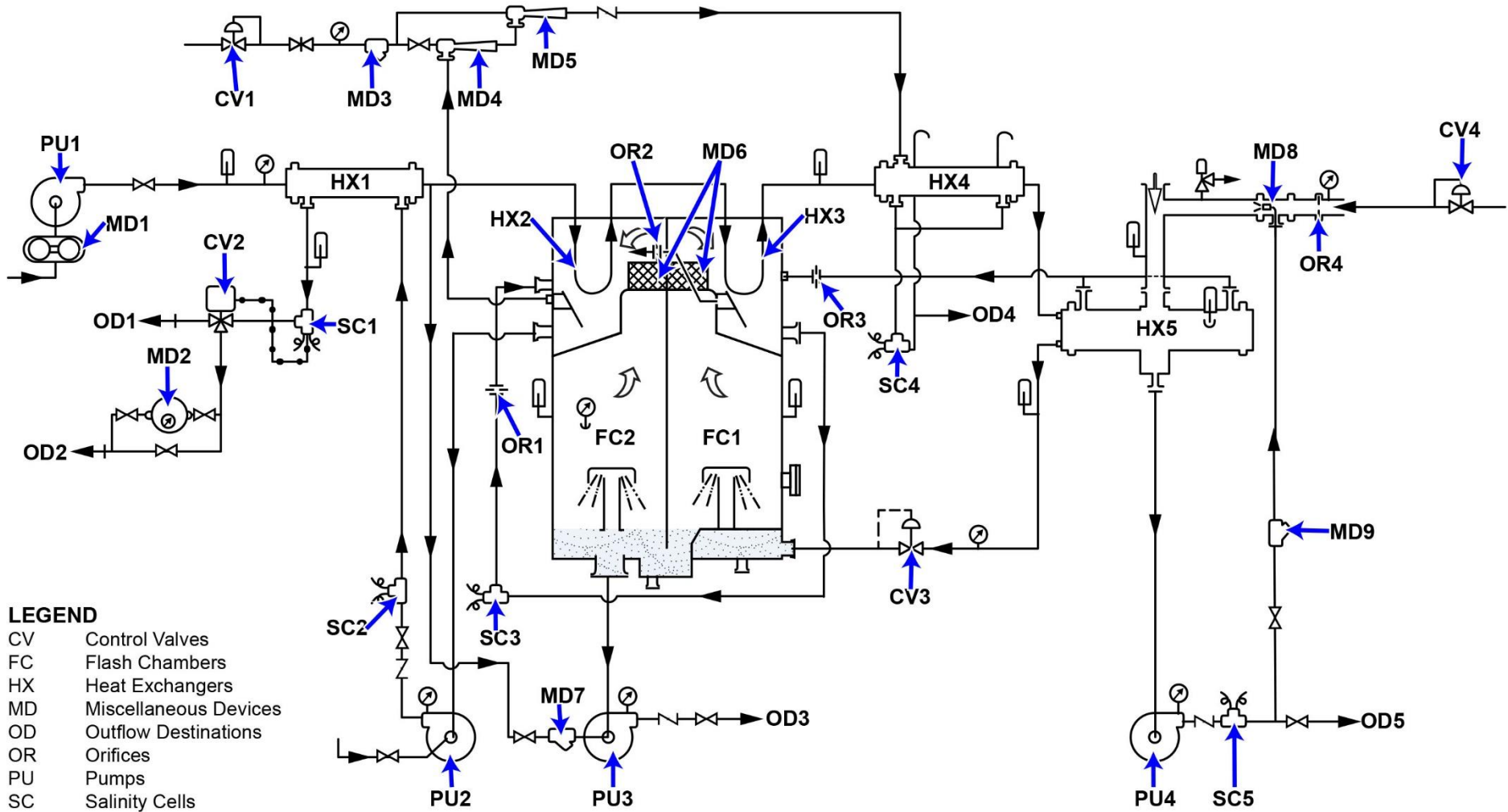
## GS-0049



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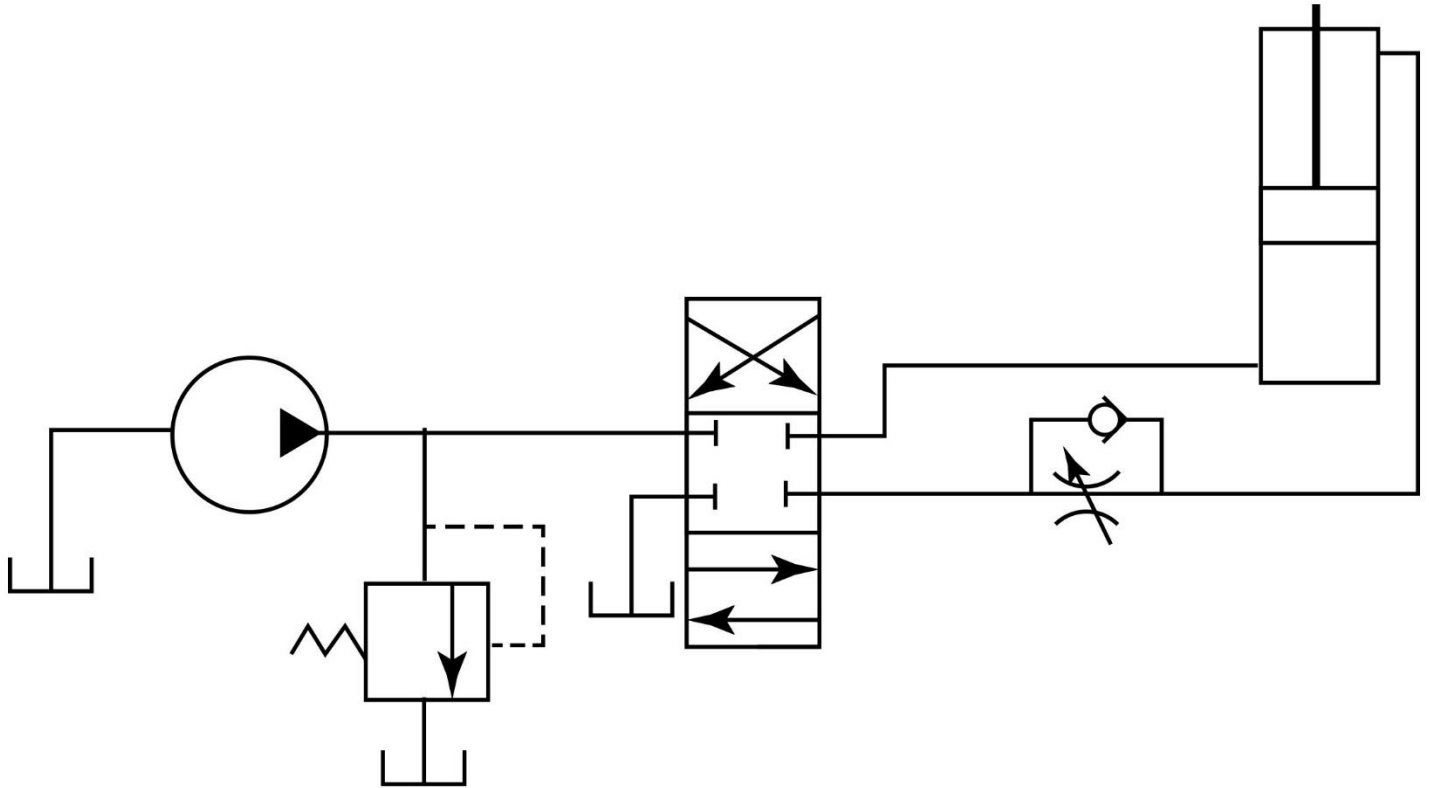


## GS-0053



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## GS-0105

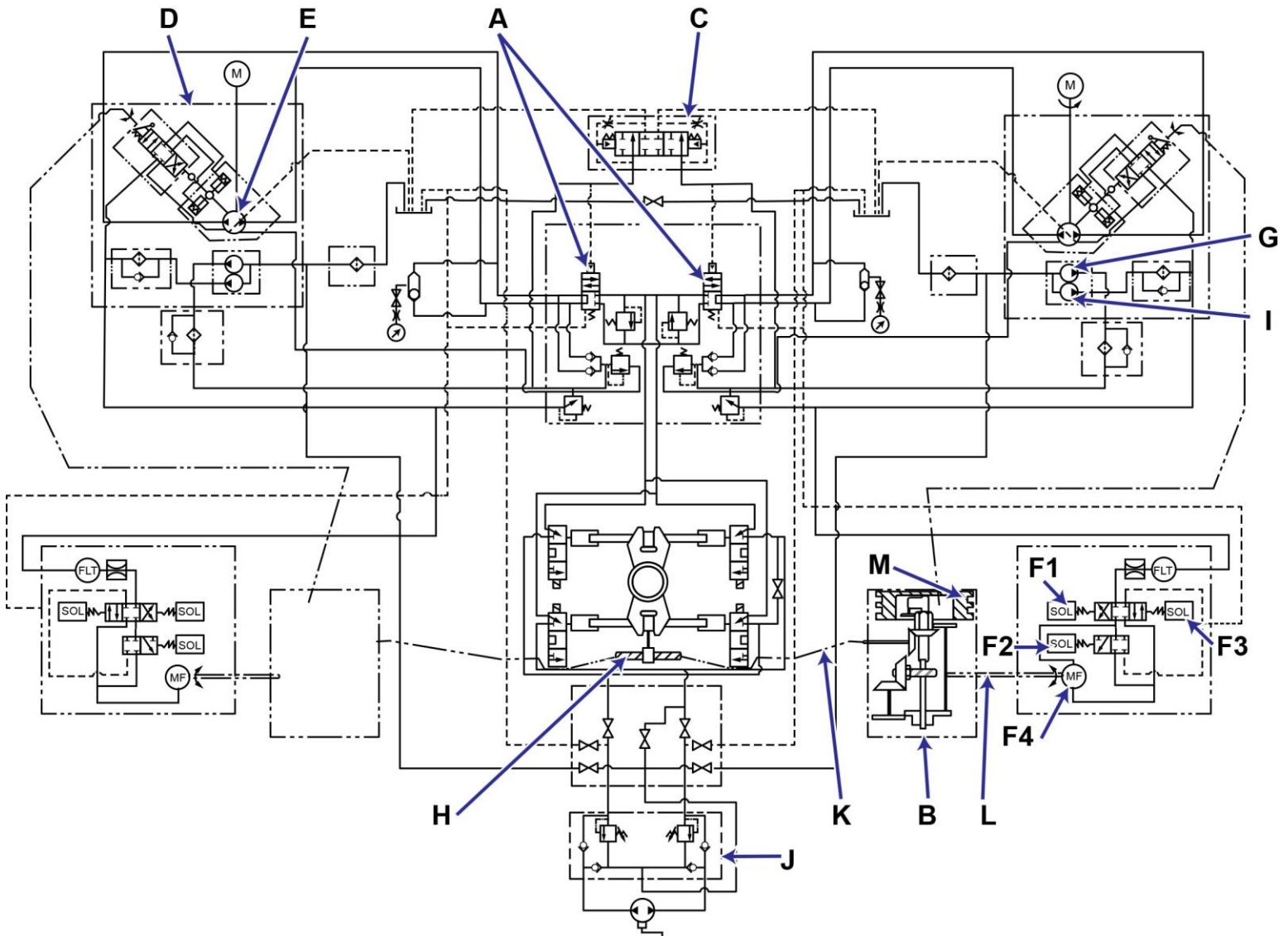


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## GS-0123



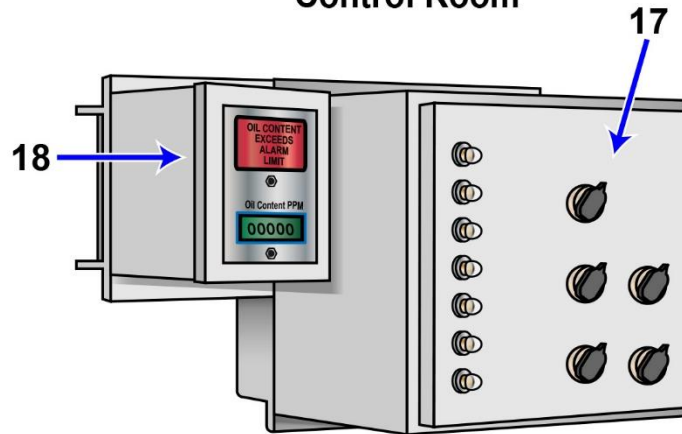
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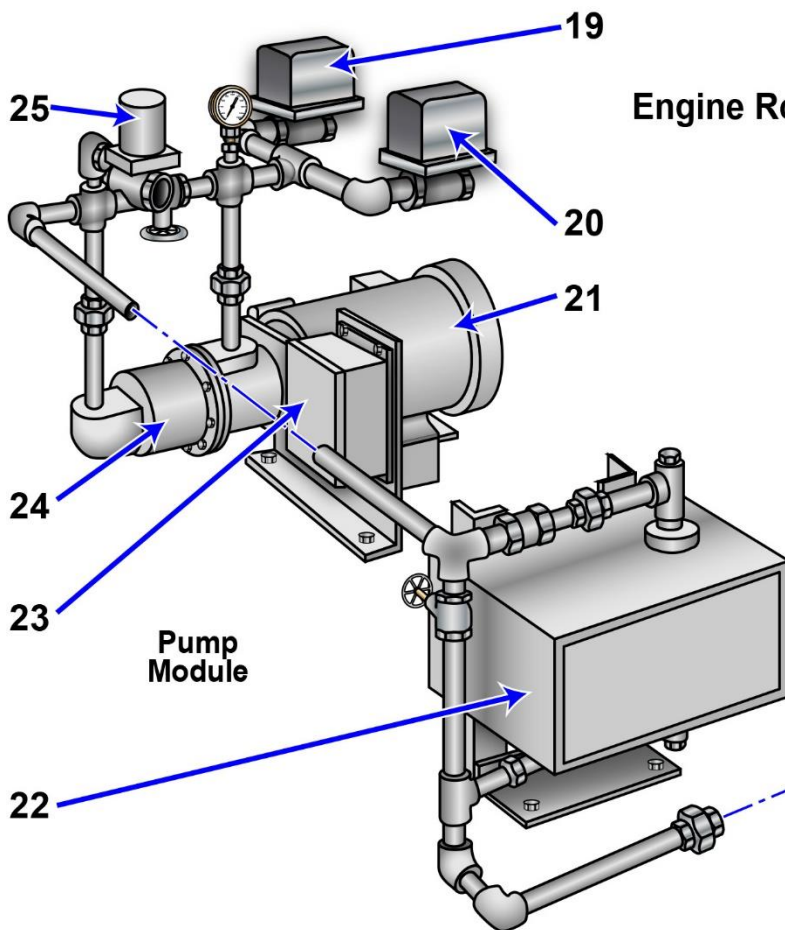
## GS-0153

### Control Room

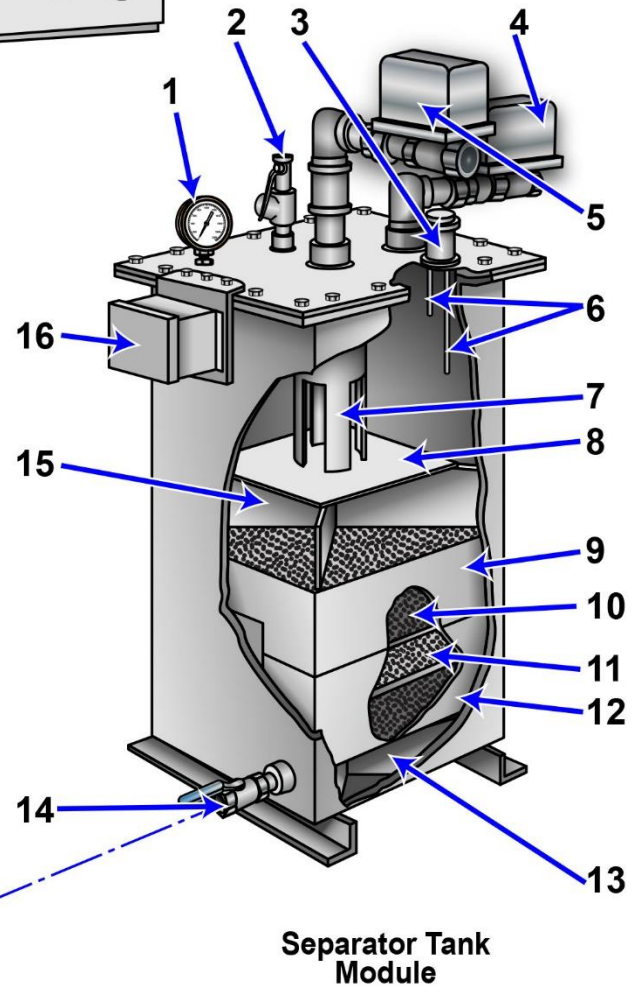


### Control Panel Assembly

### Engine Room



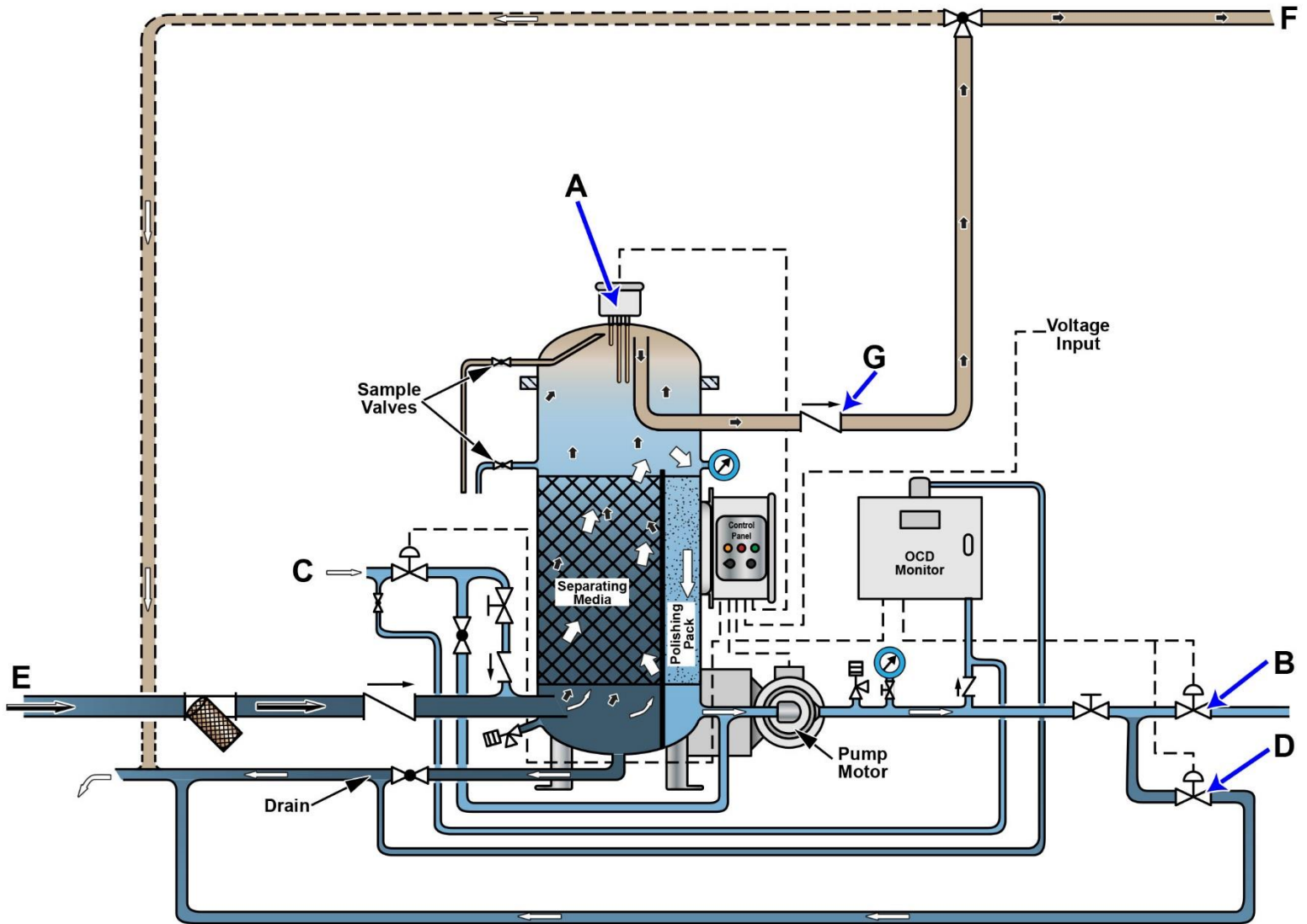
### Pump Module



### Separator Tank Module

Adapted for testing purposes only from Operator, Unit and Direct Support Maintenance Manual  
Including Repair Parts and Special Tools List for Oil Water Separator

## GS-0175



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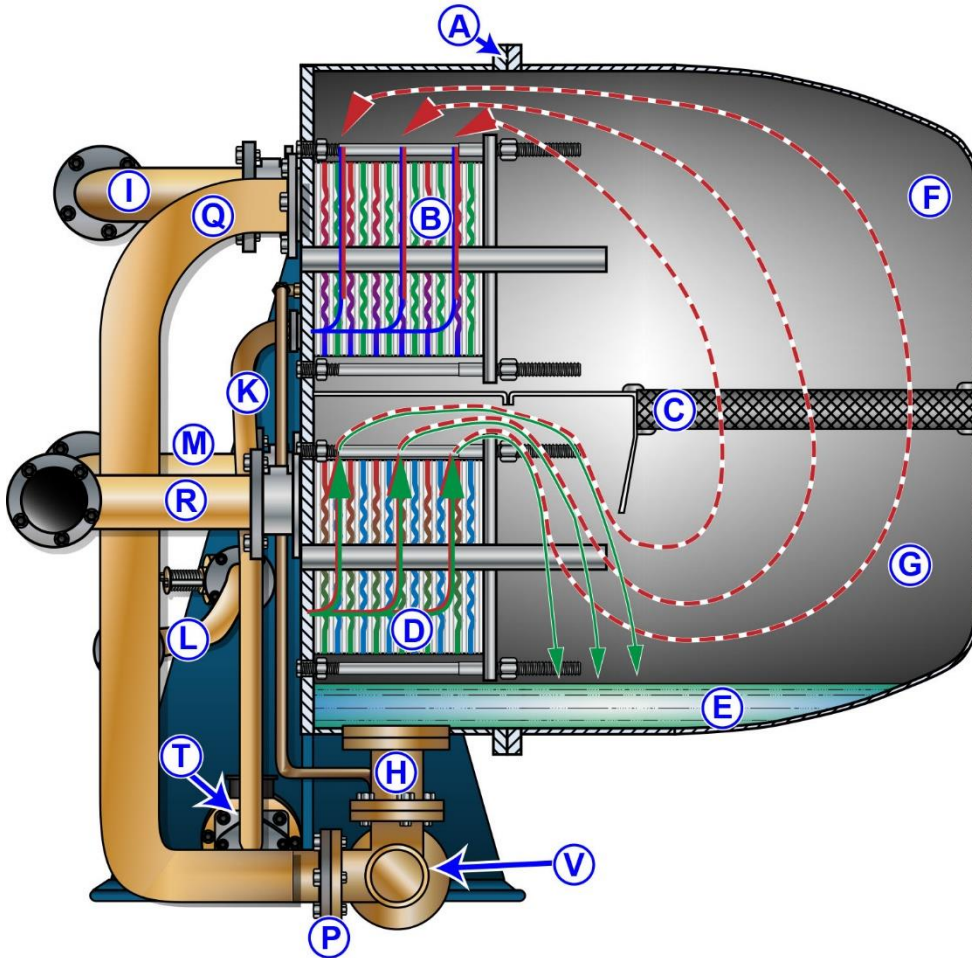
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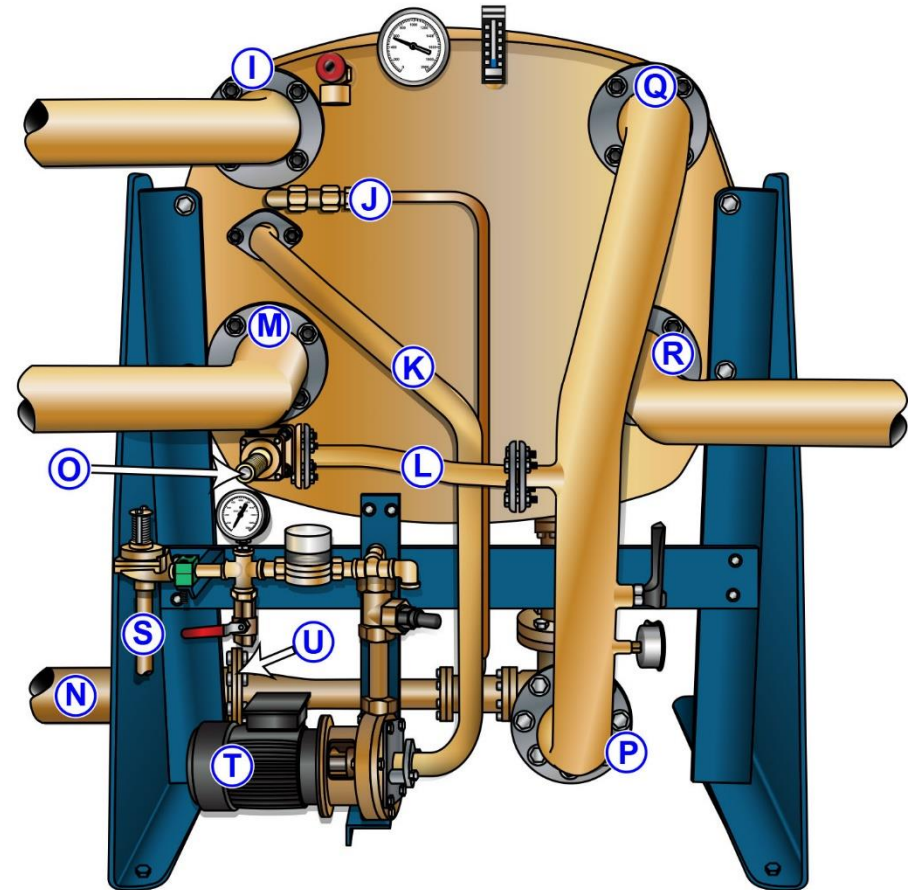


## MO-0110

Side View



Rear View

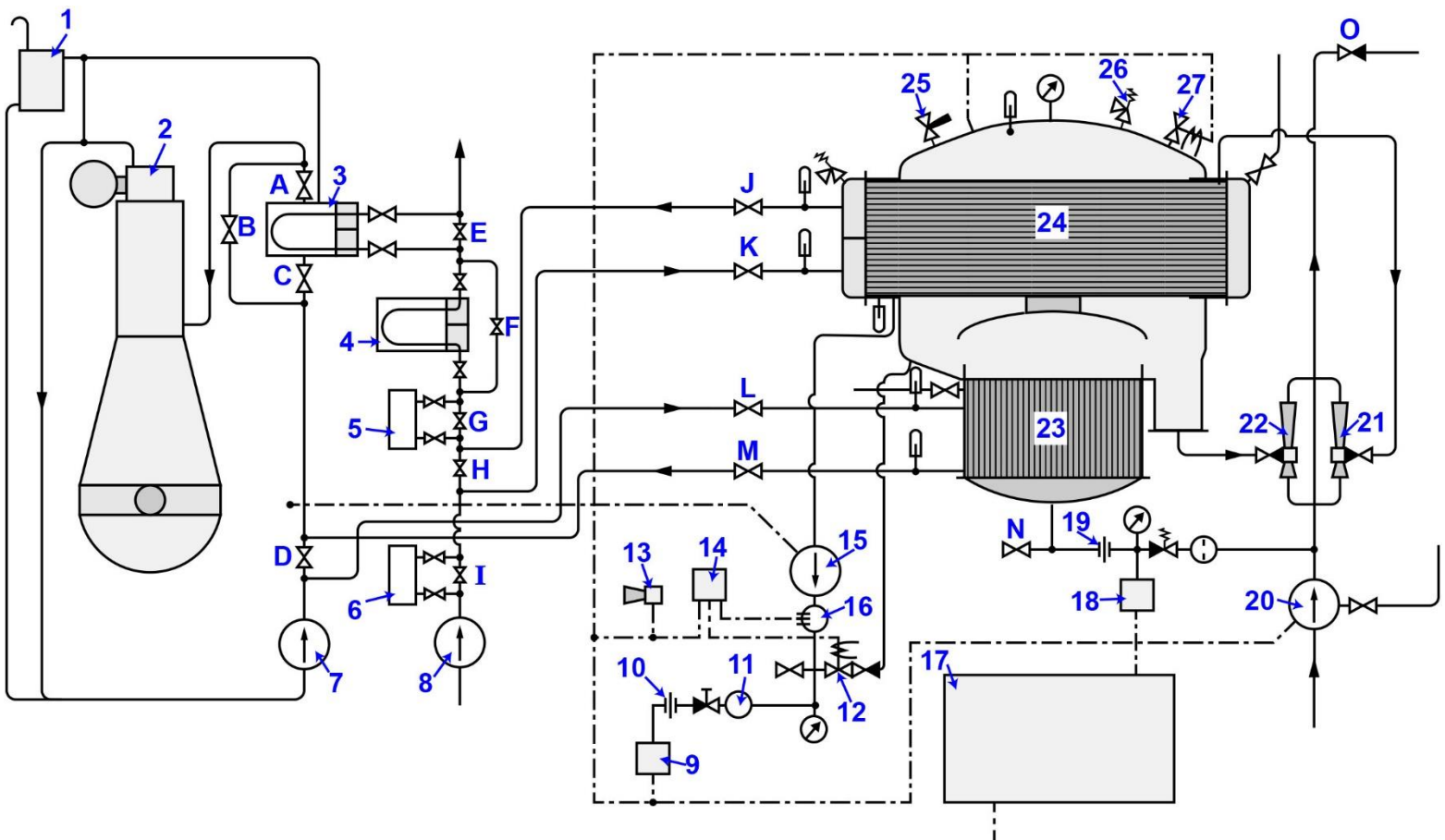


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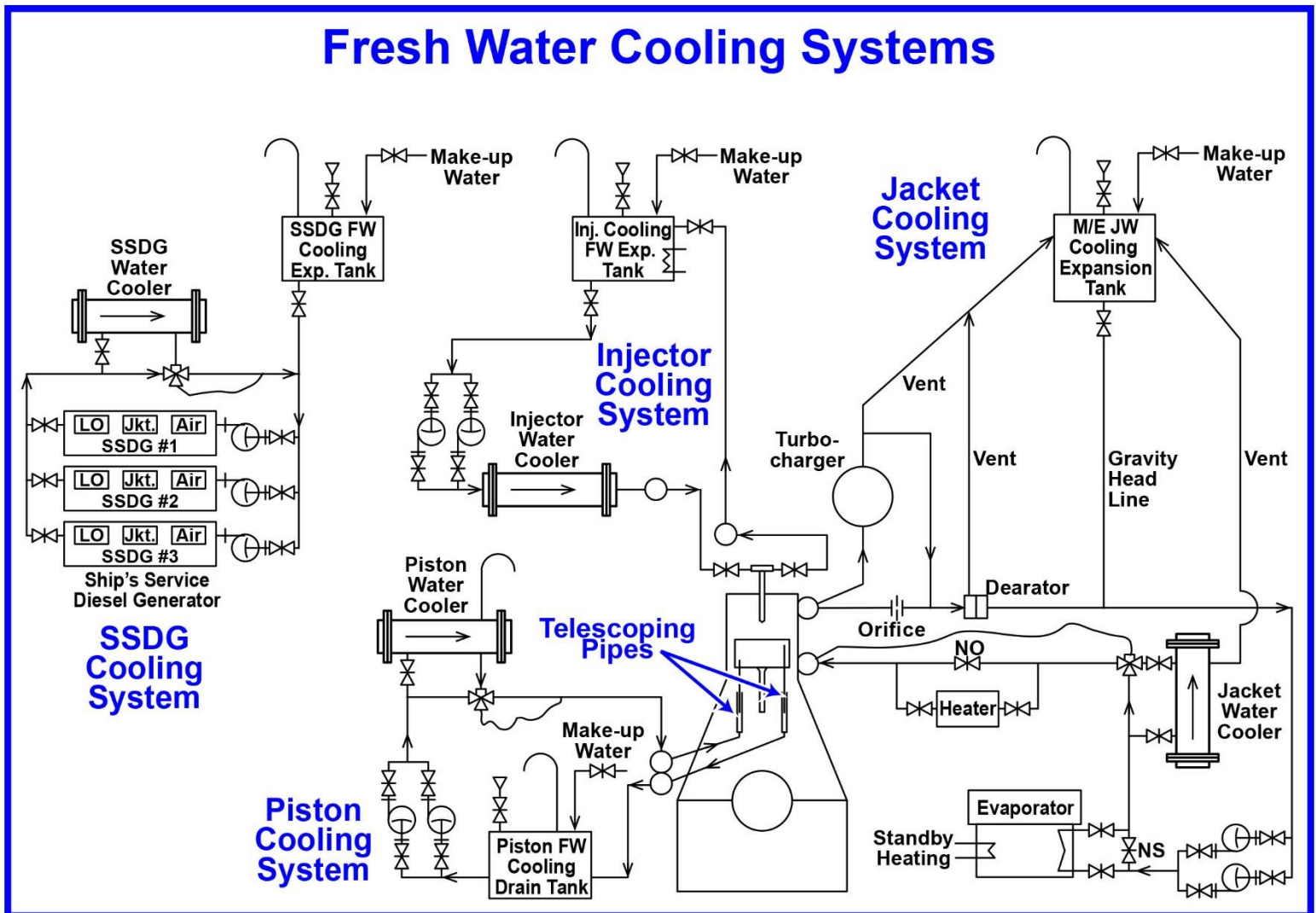
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## MO-0111



## MO-0212

### Fresh Water Cooling Systems



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