

## U.S.C.G. Merchant Marine Exam

Chief Engineer-UFIV

Q697 General Subjects

(Sample Examination)

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

1. 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 less than 15 ppm.
  - (B) The oily-water separator is in the bilge water separation processing mode with water discharging overboard with an oil content less than 15 ppm.
  - (C) 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.
  - (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 C is selected set score to 1.*

2. If a hydraulic pump is producing a noisy whine when in operation, the cause may be \_\_\_\_\_.
- (A) an oil leak across the pump shaft packing
  - (B) due to the wrong direction of rotation of the hydraulic motor
  - (C) an air leak in the pump suction line above the oil level in the reservoir
  - (D) low viscosity in the hydraulic fluid

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

3. When tuning a proportional-integral-derivative (PID) controller/loop, one should know/understand the influence of each action component on the loop. Which description of a component is correct?
- (A) Integral - component in which the input is proportional to the output.
  - (B) Proportional - component in which there is a linear relationship between set point and input.
  - (C) Derivative - component in which the input is proportional to the rate of change of the output.
  - (D) Proportional - component in which there is a linear relationship between output and input.

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

4. Once a problem has been defined and the root cause (or causes) identified, the next step in the decision-making process is developing alternative solutions to the problem. What statement best reflects how many alternatives should be considered?
- (A) The number of alternatives is not an important consideration.
  - (B) Develop only one alternative.
  - (C) Develop as few alternatives as is feasible.
  - (D) Develop as many alternatives as humanly possible.

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

5. Which recovery procedure should be used to minimize the loss of oil from the system during the recovery of refrigerant from small appliances such as a water cooler?

- (A) initial recovery
- (B) vapor recovery
- (C) liquid recovery
- (D) vapor-liquid recovery

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

6. The operation of the device shown in the illustration is dependent upon \_\_\_\_\_. Illustration GS-0116

- (A) all items, similar to "I" move as the rudder stock rotates
- (B) all items, similar to "N" move as the rudder stock rotates
- (C) both "I" and "N" move as the rudder stock rotates
- (D) neither "I" nor "N" move as the rudder stock rotates

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

7. What is the drive arrangement of refrigeration compressor shown in figure "B" of the illustration? Illustration GS-RA-41

- (A) external-drive
- (B) welded, fully hermetic
- (C) open
- (D) serviceable, bolted, accessible semi-hermetic

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

8. Concerning the arrangement of equipment and associated hoses shown in the illustration, which statement is true? Illustration GS-RA-59

- (A) When recovering refrigerant from the centrifugal chiller using this method, the entire charge may be removed in one procedure.
- (B) When recovering refrigerant from the centrifugal chiller using this method, it is possible to achieve the recovery levels required by law without any further recovery.
- (C) When recovering refrigerant from the centrifugal chiller using this method, the containment tank should be vented back to the chiller evaporator shell.
- (D) When recovering refrigerant from the centrifugal chiller using this method, the refrigerant is being recovered as a liquid.

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

9. While calibrating a 4-20 mA electronic, or a 3-15 psi pneumatic controller, with a process output of 50-250 psi, what is the controller span/range you are dealing with?
- (A) Output process range is 0-250 psi.
  - (B) Output process span is 200 psi.
  - (C) Controller input ranges are 0-40 mA and 0-15 psi.
  - (D) Controller process output span is 0-250 psi.

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

10. What is the color coding for a storage container of R-134a refrigerant?

- (A) green
- (B) purple
- (C) grey
- (D) light blue

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

11. How does a refrigeration solenoid valve differ from a modulating valve?

- (A) A liquid line solenoid valve is either completely opened or closed, whereas a modulation valve is infinitely positioned according to the strength of the applied electrical signal.
- (B) Both valves operate in exactly the same manner, only the manufacturer's terminology is the differentiating factor.
- (C) A solenoid valve can only be installed in liquid lines.
- (D) Solenoid Valves are only used in low voltage refrigeration control systems, while modulation valves are used in high voltage applications.

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

12. If the superheat value of the thermostatic expansion valve is adjusted too high, what would be the result?

- (A) the heat removal capacity of the evaporator will increase
- (B) the suction line of the compressor will be abnormally warm
- (C) the evaporator will be overfed with liquid refrigerant
- (D) the suction line of the compressor will be abnormally cold

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

13. Some managers think the average person likes work, willingly assumes responsibility, and is trustworthy. What type of leadership style is such a manager likely to adopt?

- (A) Transactional leadership style.
- (B) Structured, autocratic leadership style.
- (C) Hierarchical, dictatorial leadership style.
- (D) Supportive, participative leadership style.

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

**14.** While calibrating an electronic 4-20 mA or 3-15 PSI pneumatic controller, what is the value of 'Live Zero'?

- (A) '0' for input span and another value for output range.
- (B) 4 mA or 3 PSI for process output range.
- (C) '0' for span and range.
- (D) 4 mA or 3 PSI.

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

**15.** Which of the following is true concerning the class "A" air conditioning system shown in the illustration as used to condition the air of large public spaces? Illustration GS-RA-09

- (A) The preheater steam flow is controlled by the space thermostat.
- (B) It is not possible for both the cooling coil and the steam heated reheater to be used simultaneously.
- (C) The dry bulb room temperature is controlled by a steam heated reheater and its associated pneumatic control valve.
- (D) The reheater is not used when in the cooling mode.

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

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

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

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

**17.** One of the means of alternative dispute resolution regarding a collective bargaining agreement dispute is arbitration. What is meant by arbitration?

- (A) Direct, in-house negotiated settlement between company and union representatives.
- (B) Agreement to abide by a binding decision rendered by a company and union agreed-upon impartial person.
- (C) Settlement reached as the result of litigation as part of a judicial proceeding in court.
- (D) Negotiated settlement between company and union representatives facilitated by a mediator.

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

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

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

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

**19.** Which of the following shipboard groups would be an example of an informal group?

- (A) Those officers and crew assigned to a maintenance task on a ship.
- (B) Those officers and crew assigned to the safety committee of a ship.
- (C) Those officers and crew assigned to a particular ship.
- (D) Those officers and crew assigned to the engineering department of a ship.

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

**20.** Hidden edges in objects are represented in blueprints by \_\_\_\_\_.

- (A) a thin solid line
- (B) a thick solid line
- (C) dashed lines having alternating long and short dashes
- (D) dashed lines having approximately equal length dashes

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

**21.** The fluid used as a source of actuating power against the underside of the unloader power element piston of the refrigeration compressor capacity control mechanism illustrated is obtained from where? Illustration GS-RA-13

- (A) gas discharge from the compressor
- (B) discharge of the compressor lube oil pump
- (C) high side liquid receiver
- (D) discharge of a secondary hydraulic pump specifically installed for this operation

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

- 22.** As a result of a load or set point 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 maximize the settling time and maximize the residual error.
  - (B) The closed-loop control system should minimize the settling time and minimize the residual error.
  - (C) The closed-loop control system should minimize the settling time and maximize the residual error.
  - (D) The closed-loop control system should maximize the settling time and minimize the residual error.

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

- 23.** Engineering departments may experience a barrier to free and open communication vertically upward from subordinates to managers. What is the primary reason for this barrier to communication?
- (A) The very fact that managers are more technically proficient than their subordinates often creates a barrier to open and free communication vertically upward.
  - (B) The very fact that managers are usually older than their subordinates often creates a barrier to open and free communication vertically upward.
  - (C) The very fact that managers are more knowledgeable than their subordinates often creates a barrier to open and free communication vertically upward.
  - (D) The very fact that managers have authority, status and power over their subordinates often creates a barrier to open and free communication vertically upward.

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

- 24.** As a chief engineer you are reviewing the engine room logbook. You must ensure that all entries are made properly. What should be your criteria for how a watch officer makes a correction to an incorrect log entry?
- (A) The incorrect entry should be completely obliterated and the new correct entry made just below the obliterated incorrect entry.
  - (B) The new correct entry should be written directly on top of the old incorrect entry making every effort to cleverly disguise the incorrect entry.
  - (C) The incorrect entry is to be completely erased and the new correct entry written on top of the erasure so no evidence remains of the incorrect entry.
  - (D) The incorrect entry should have a thin line drawn through the error and be initialed by the person making the correction so that the incorrect entry is still visible.

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

**25.** When new piping sections have been fabricated for installation in a hydraulic system, prior to installation the piping should be \_\_\_\_\_.

- (A) cleaned using a water-based detergent
- (B) descaled by using a pickling solution
- (C) hydrostatically tested to 100% of maximum working pressure
- (D) all of the above

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

**26.** Setting the relief valve opening pressure in a hydraulic system lower than the required operating pressure will result in \_\_\_\_\_.

- (A) extended system life
- (B) accelerated action of the system components
- (C) overheating of the system
- (D) over speeding of the hydraulic pump

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

**27.** With a machinery lubricating oil analysis program, it is important to monitor trends over time. What would be indicated by a sudden increase in metallic content of a recent sample of used diesel engine crankcase lubricating oil?

- (A) Sudden contamination of the lubricating oil with coolant.
- (B) Sudden dilution of the lubricating oil with fuel.
- (C) Increased wear rates of engine parts.
- (D) Depletion of lubricating oil additives.

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

**28.** Of the individual components of a pre-fire planning package, which component when used with stability charts would be particularly useful in decision-making as it applies to the effect of water accumulated during firefighting efforts and the free surface effect?

- (A) General arrangement plan
- (B) Deadweight and capacity plan
- (C) Fire control plan
- (D) Pre-fire plan

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

**29.** Referring to the illustration, an oil/water separator is in the recirculation mode due to high oil content of the processed water outlet. What action may be required before the unit is capable of discharging overboard once again? Illustration GS-0175

- (A) Flushing the oil content detector with clean water.
- (B) Flushing the bilges with an emulsifying agent.
- (C) Flushing the bilges with a detergent.
- (D) Cleaning the bilge suction strainer.

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

**30.** In a refrigeration system, what component is installed directly downstream of the thermal expansion valve?

- (A) box solenoid valve
- (B) receiver
- (C) evaporator coil
- (D) compressor

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

**31.** 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 water exiting under a 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 lower oil/water interface detection probe fails to initiate the oil discharge mode.
- (D) The clean water supply solenoid fails to open, and as a result provides no discharge pressure.

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

**32.** A thermostatic expansion valve is properly controlling evaporator superheat. Adjusting this valve to lower the evaporator superheat setting will result in which of the following?

- (A) the expansion valve will further close
- (B) the expansion valve diaphragm will rupture
- (C) the evaporator pressure will decrease
- (D) the evaporator feed will increase

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

**33.** In a closed-loop process control system, what is meant by error?

- (A) The progressive reduction or suppression of oscillation in a component.
- (B) The criterion of good control that permits no overshoot when the set point is changed.
- (C) The signal in a controller that is obtained by subtracting the measured value of the controlled value from the set point.
- (D) The ratio of the amplitude of the output signal of a component divided by the amplitude of the input signal.

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

**34.** Using the device shown in the illustration, which of the following statements is true when adding refrigerant as a vapor to the low side of the refrigeration system? Illustration GS-RA-01

- (A) The hose labeled "H" should be connected to the suction service valve service port, the hose labeled "J" should be connected to the vapor valve on the refrigerant cylinder and the valve labeled "G" should be open.
- (B) The hose labeled "H" should be connected to the suction service valve service port, the hose labeled "J" should be connected to the vapor valve on the refrigerant cylinder and the valve labeled "G" should be closed.
- (C) The hose labeled "K" should be connected to the suction service valve service port, the hose labeled "J" should be connected to the vapor valve on the refrigerant cylinder and the valve labeled "C" should be open.
- (D) The hose labeled "K" should be connected to the suction service valve service port, the hose labeled "J" should be connected to the vapor valve on the refrigerant cylinder and the valve labeled "C" should be closed.

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

**35.** The compressor used in a water-cooled air conditioning system is short-cycling. A service check determines that the suction pressure remains above the normal cut-in point during cycling and that the discharge pressure rapidly builds up to the cut-out point while running and gradually falls to the cut-in point during the off cycle. What is likely the cause?

- (A) front seated liquid line service valve
- (B) back seated discharge service valve
- (C) loosely fitted compressor drive belt
- (D) reduction in condenser water flow (scaled condenser)

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

**36.** In addition to the drive belt itself, a V-belt that is tensioned too tight will cause excessive wear to what other drive component?

- (A) the prime mover drive pulley
- (B) the shaft of the prime mover
- (C) the compressor drive pulley
- (D) motor shaft and compressor main bearings

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

**37.** Personnel servicing a refrigeration system that exposes them to commonly used refrigerants should wear what type of personal protective equipment?

- (A) an all purpose gas mask
- (B) rubber soled shoes
- (C) goggles and gloves
- (D) a respirator

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

**38.** What is meant by the term empowering employees?

- (A) Gaining employee acceptance and identification based on personal charisma.
- (B) Rewarding employees with positive rewards such as the availability of overtime.
- (C) Gaining employee compliance under threat of punishment such as pulling overtime.
- (D) Granting employees authority to make key decisions by delegation.

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

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

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

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

**40.** Rudder position is shown on the bridge by the \_\_\_\_\_.

- (A) rudder angle indicator
- (B) follow-up gear
- (C) telemotor position
- (D) Rapson slide indicator

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

**41.** Hydraulically, servo-operated, automatic, change over valves, utilized in a two ram hydraulic steering gear, serve to \_\_\_\_\_.

- (A) prevent either main pump from being hydraulically motored when idle by cross pressure flow
- (B) allow an alternate main pump to start in the fully loaded condition thus developing immediate full torque
- (C) prevent both units from operating simultaneously which could result in doubling the flow of oil and pressure leading to over pressurization of the system
- (D) all of the above

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

**42.** As the speed of an oil lubricated ball bearing increases, fluid friction, due to churning, generates heat. This condition may be avoided by \_\_\_\_\_.

- (A) reducing the quantity of lubricant until only a mist of oil is present on the ball bearings
- (B) installing oil rings on the ball bearings
- (C) adding more lubricant until the ball bearings are completely covered with a layer of oil
- (D) maintaining a continuous fluid film of oil on the bearings

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

**43.** Using the information in the illustration shown, the tail of the welding symbol will \_\_\_\_\_.  
Illustration GS-0030

- (A) designate the type of weldment
- (B) designate the welding specifications
- (C) specify the size of weldment
- (D) specify the direction of welding

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

**44.** Where would you find a list of the firefighting equipment required on your vessel?

- (A) Muster List ("Station Bill")
- (B) Certificate of Inspection
- (C) Official logbook
- (D) In the captain's desk

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

**45.** When the sensing bulb of a thermostatic expansion valve is charged with a fluid different from the charge used in the system, what name of the charge is associated with the power element?

- (A) cross charged
- (B) blended charged
- (C) straight charged
- (D) mixed charged

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

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

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

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

**47.** Oil sprays on to a hot piece of machinery, catches fire and causes \$35,000 damage to your vessel. By law this must be reported to the \_\_\_\_\_.

- (A) U.S. Salvage Association Survey at the next U.S. port
- (B) principal surveyor of the American Bureau of Shipping at the next U.S. port
- (C) Officer in Charge, Marine Inspection at the first port of arrival
- (D) nearest Coast Guard unit

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

**48.** What type of maintenance system would be associated with accomplishing maintenance after a machinery breakdown?

- (A) Planned maintenance system
- (B) Condition-based maintenance system
- (C) Corrective maintenance system
- (D) Predictive maintenance system

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

- 49.** Consider the following training objective for a training session designed for training your crew how to pump bilges:

"Using the engine room bilge system of the M/V Underway where a bilge pocket requires pumping out and the automated bilge pumping controls have been disabled, by the end of the training session the participants will be able to pump an engine room bilge pocket dry manually to the bilge water holding tank in conformance with the vessel's engine room bilge pumping procedure checklist. There shall be no violations of the domestic and international pollution prevention regulations."

What role does the phrase "where a bilge pocket requires pumping out" serve in the objective statement?

- (A) It states one of the standards of performance to be achieved.
- (B) It specifies the single outcome to be achieved.
- (C) It states a performance by using action words.
- (D) It specifies a performance input condition.

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

- 50.** What type of managerial controls measure actions or activities that have already occurred and implement corrective action if needed?

- (A) Concurrent controls
- (B) Feed forward controls
- (C) Feedback controls
- (D) Screening controls

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

- 51.** Which of the speeds listed represents the synchronous speed rating of the lube oil pump motor shown in the illustration? Illustration GS-0011

- (A) 1,000 RPM
- (B) 1,150 RPM
- (C) 1,200 RPM
- (D) 1,250 RPM

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

**52.** In order for discipline to be administered fairly, discipline must carry a clear advance warning, be immediate, be consistent, and be impersonally administered. What is meant by consistency?

- (A) Getting the employee's work behavior consistent with the work rules by disciplining the act and not the person by avoiding getting into personalities.
- (B) Employees should know what is and what is not expected of them and what disciplinary action would be imposed for an offense.
- (C) The disciplinary process should begin as soon as possible after the violation of the rules is observed.
- (D) If two people commit the same offense under the same circumstances, they should receive the same disciplinary action.

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

**53.** A reciprocating refrigeration compressor may be tested for leaking discharge valves by stopping the compressor, turning the discharge service valve all the way in, and then turning the compressor over by hand. If the discharge valves are leaking, the compound gage will show pressures which react in which way?

- (A) rising and falling with each stroke
- (B) decreasing to a vacuum
- (C) increasing with each stroke
- (D) decreasing with each stroke

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

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

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

**55.** During the initial cooling down of a box temperature in a refrigeration system, which of the devices listed is used to prevent excessive gas pressure at the compressor suction for the purpose of prevention of overloading of the compressor driver?

- (A) High-pressure cutout
- (B) Crankcase pressure regulator
- (C) Low-pressure cutout
- (D) Solenoid valve

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

**56.** What statement is true concerning the platform interlock devices associated with a winding drum or traction drive cargo elevator onboard ship?

- (A) Platform interlocks are used to prevent door operation if the platform is proved at a deck level and only allow door operation when the platform is at a position other than a deck level.
- (B) Platform interlocks are used to prevent door operation if the platform is at other than a deck level and only allow door operation when the platform is proved at a deck level.
- (C) Platform interlocks are used to override elevator emergency status in a shipboard emergency when elevators are required to be used.
- (D) Platform interlocks are used to prevent elevator operation in a shipboard emergency when elevators are not to be used.

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

**57.** In a two stage centrifugal air conditioning system, the liquid refrigerant passes through the condenser directly to what component?

- (A) chiller
- (B) evaporator
- (C) economizer
- (D) expansion valve

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

**58.** In accordance with 46 CFR Subchapter E (Load Lines), an international and coastwise load line assignment and certificate issued to a vessel by the American Bureau of Shipping is valid for a period of \_\_\_\_\_.

- (A) 1 year
- (B) 2 years
- (C) 4 years
- (D) 5 years

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

**59.** A 'Proportional Only' controlled automatic process loop is oscillating continually, above and below the set point. To stabilize this controller and loop using the 'gain' adjustment, what controller/loop response would you expect upon process changes vs. set point?

- (A) By decreasing reset, the system's oscillations should subside vs. set point after an upset.
- (B) By decreasing gain, the process should return to a straight line response vs. set point after an upset.
- (C) By decreasing gain gradually, the process should stabilize in a 'quarter wave' response to system's upsets vs. the set point.
- (D) By increasing gain, the system's oscillations should subside vs. set point after an upset.

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

**60.** Which of the following document types would offer the greatest flexibility in carrying out its intent?

- (A) Policies
- (B) Regulations
- (C) Rules
- (D) Standing orders

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

**61.** Which of the following statements describes the characteristics of precision manufactured roller bearings?

- (A) They have a relatively high power loss due to friction.
- (B) Their lubrication is complicated and requires constant attention.
- (C) They are well adapted to variable speed operation.
- (D) They are not capable of maintaining alignment over long periods of time.

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

**62.** High suction pressure accompanied by low suction temperature to a refrigeration system compressor is caused by which of the following?

- (A) a clogged liquid-line strainer
- (B) the expansion valve is insufficiently opened
- (C) the expansion valve being open too wide
- (D) the king valve is insufficiently open

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

**63.** What statement is true concerning a well-planned turnover procedure from one crew to another?

- (A) The relieving crew embarks as the relieved crew disembarks.
- (B) The sequence of relieving crew embarking and relieved crew disembarking is not critical.
- (C) The relieving crew embarks prior to the relieved crew disembarking.
- (D) The relieving crew embarks after the relieved crew disembarks.

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

**64.** When checking zinc plates, or pencil zincs in the refrigerating system condenser, what should you do?

- (A) replace the zincs if deteriorated by 50%
- (B) renew the plates at each inspection
- (C) file the plates to change the negative value
- (D) paint and insulate the plates to prevent corrosion

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

**65.** In order for the hydraulic pump installed in a constant flow system to maintain adequate flow, the pump suction should \_\_\_\_\_.

- (A) be taken directly off the reservoir bottom without regard to filters or strainers
- (B) be provided with three to five 1/2 inch holes in the vertical, suction line to prevent pump starvation should the strainer become fouled
- (C) be arranged to develop a maximum vacuum of approximately 10" of mercury
- (D) be arranged to develop the theoretically maximum attainable vacuum

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

**66.** 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.*

**67.** In a closed-loop process control system, what term is used to describe the action of measuring the difference between the actual result and the desired result and using that difference to drive the actual result toward the desired result?

- (A) Instability
- (B) Gain
- (C) Feedback
- (D) Dead band

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

**68.** Vibration analysis can provide comparative data of operating condition of rotating machinery. At what positions should such readings be taken at bearing housings and foundations?

- (A) Vertical and horizontal.
- (B) Vertical, horizontal and axial.
- (C) Axial and horizontal.
- (D) Vertical and axial.

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

- 69.** When recovering the remaining R-134a refrigerant from the centrifugal chiller shown in the illustration as a vapor using the recovery unit's compressor, in addition to opening valves "1a", "1b", and the compressor suction and discharge isolation valves, which of the following would be the correct valve lineup? Illustration GS-RA-28
- (A) valves "2", "5", "7", "8", and "10" open; valves "3", "4", and "6" closed
  - (B) valves "3", "4", and "6" open; valves "2", "5", "7", "8", and "10" closed
  - (C) valves "3", "4", "7", "6" and "10" open; valves "2", "5", and "8" closed
  - (D) valves "3", "5", and "6" open; valves "2", "4", "7", "8", and "10" closed

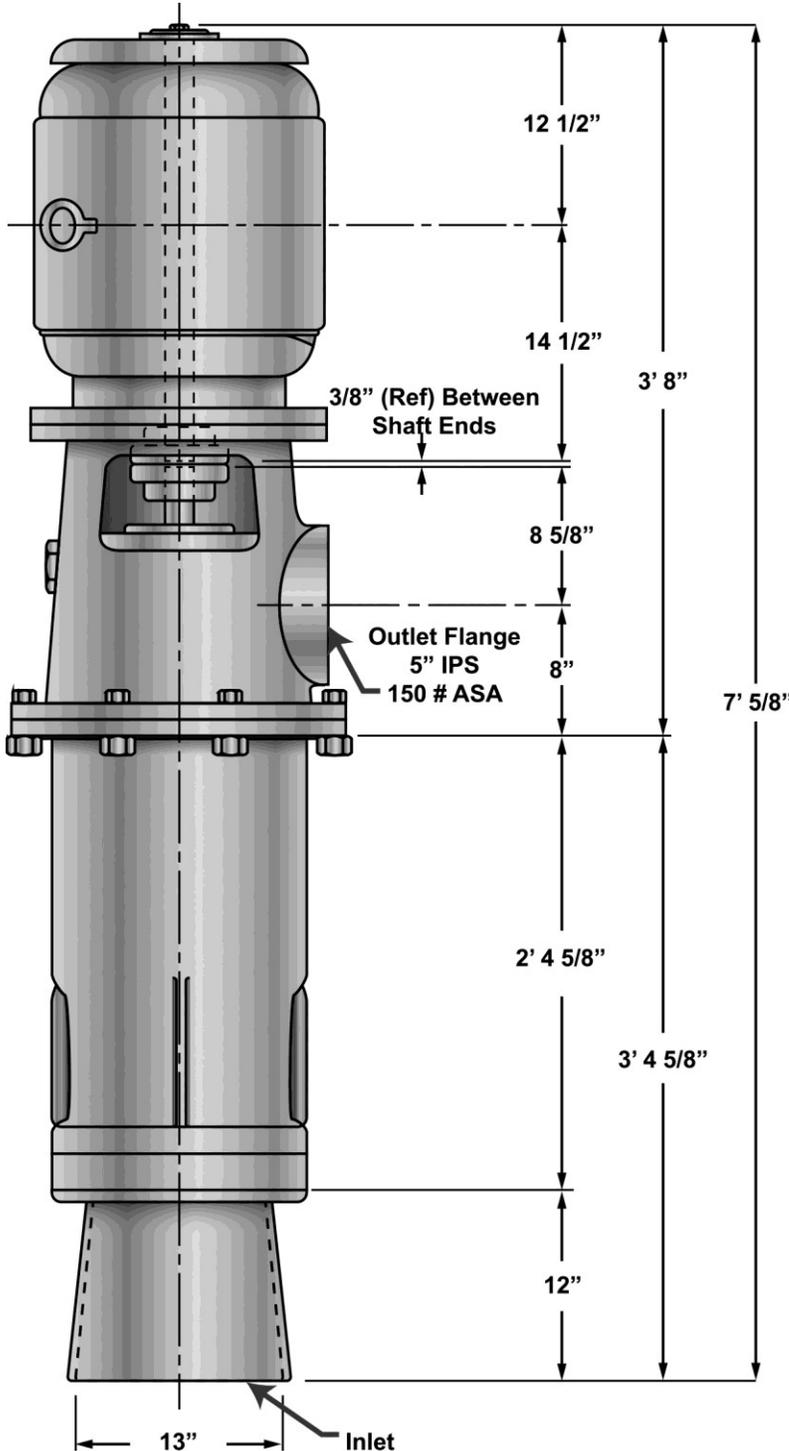
*If choice B is selected set score to 1.*

- 70.** If oil under pressure is supplied to the area noted as "N" on the vane in the illustration \_\_\_\_\_. Illustration GS-0116

- (A) "O" will be hydraulically locked in place even though oil is returned to the main pump from the area between "M" and "I"
- (B) "O" will rotate clockwise as oil is returned from the area between "M" and "I"
- (C) "O" will rotate counter-clockwise as oil is returned from the area between "M" and "I"
- (D) "Q" will rotate counter-clockwise as oil is returned from the area between "M" and "I"

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

## 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

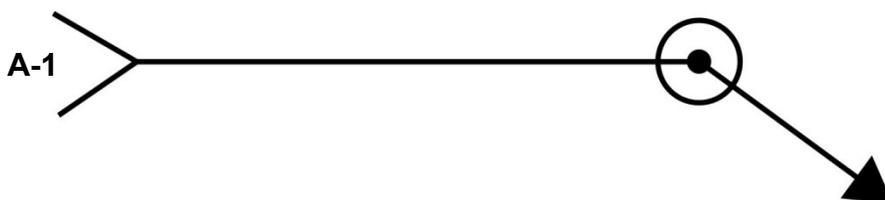
Capacity G. P. M.	400
Speed R. P. M.	1150
Suction Lift "HG	10
B, H, P. @ 1200 SSU-75° F	24.9
Oil viscosity Range, SSU	74-7000
Viscosity Normal SSU @ 140° F	155
Discharge Normal PSIG	55
Fluid Handled, Lube Oil	2190 TEP.
Navy Specification	MIL-L-17331
Oil Temperature Range ° F	40-180

Illustration scale: 1" = 1'

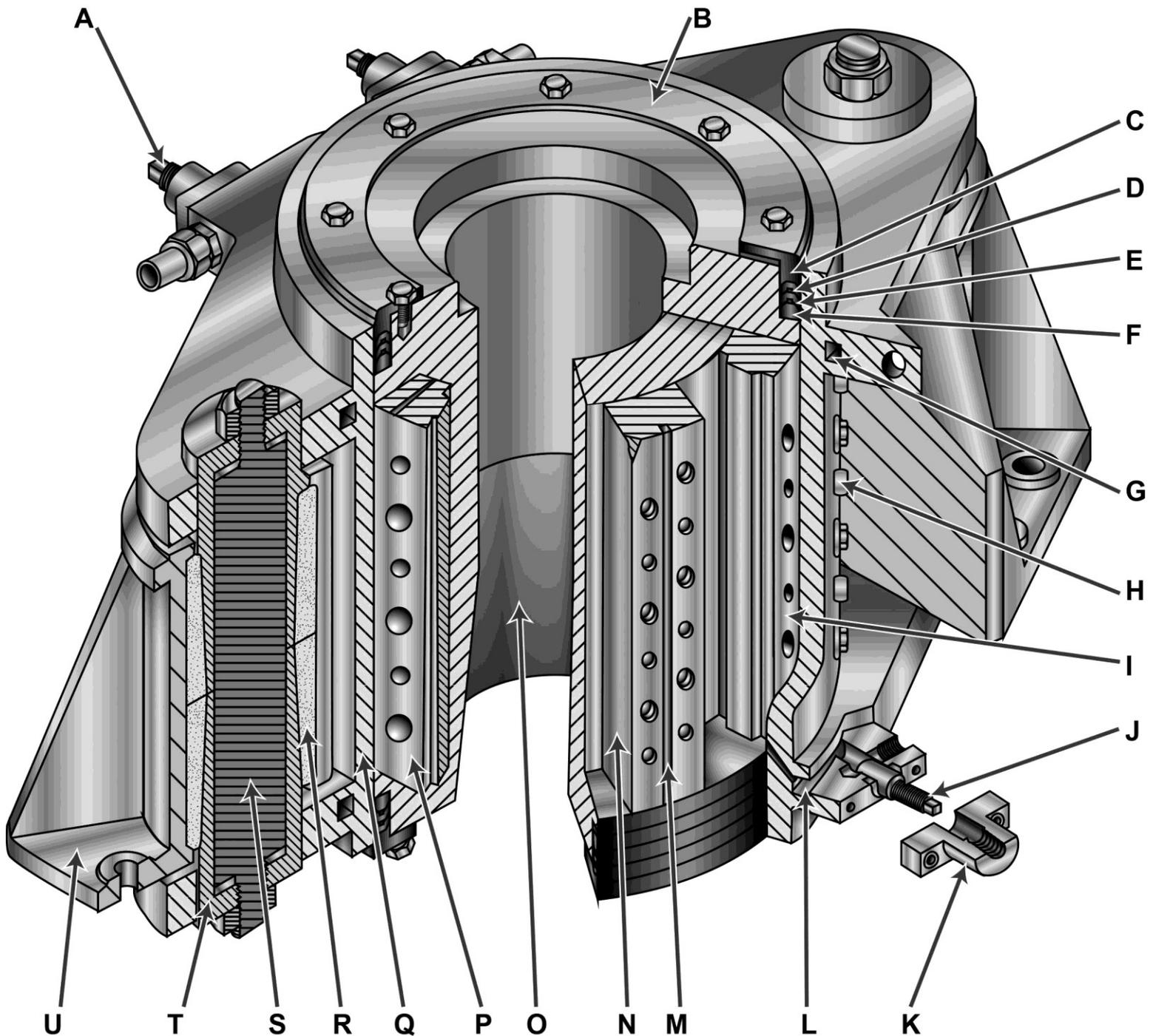
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## GS-0030



## GS-0116

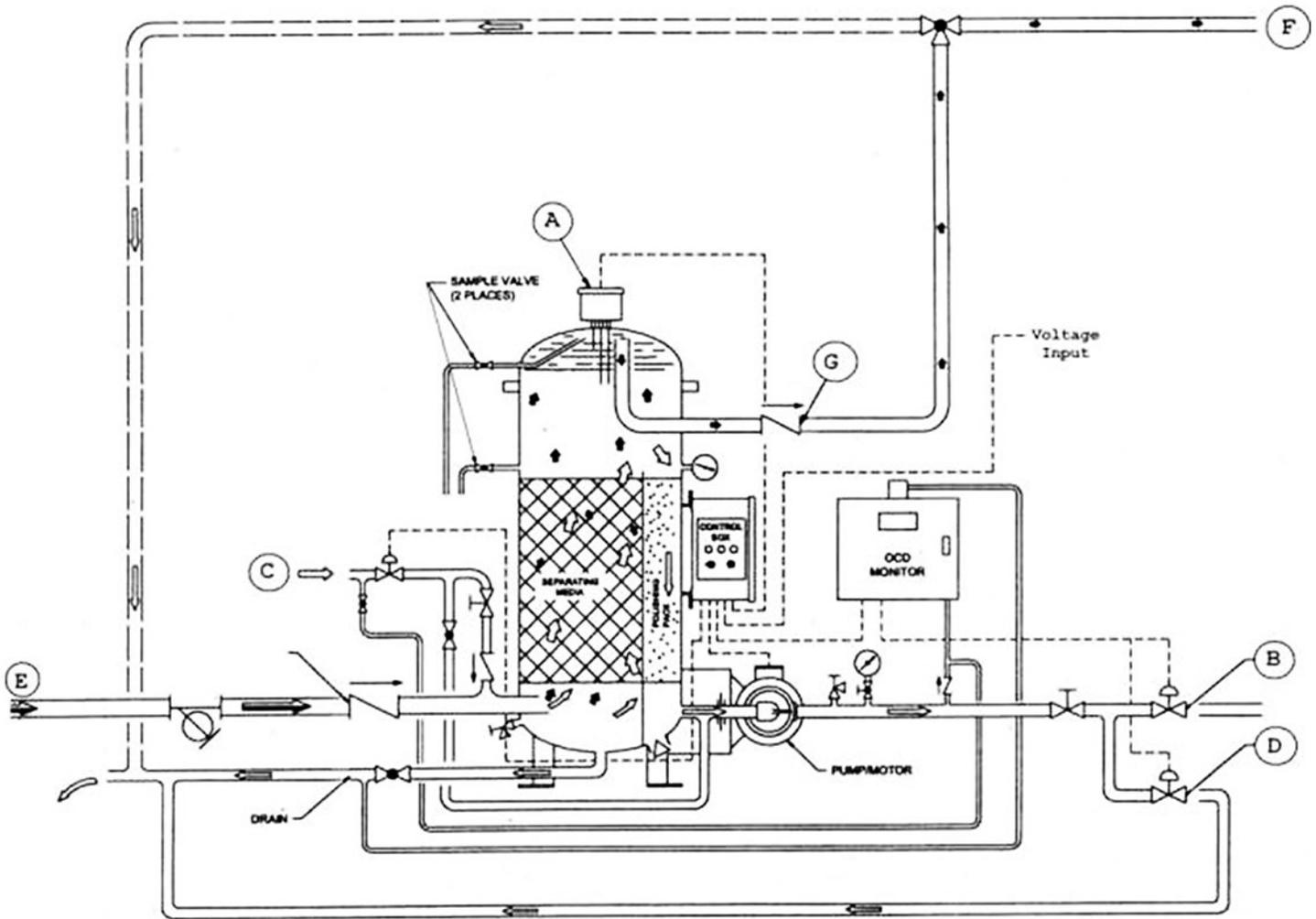


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## GS-0175

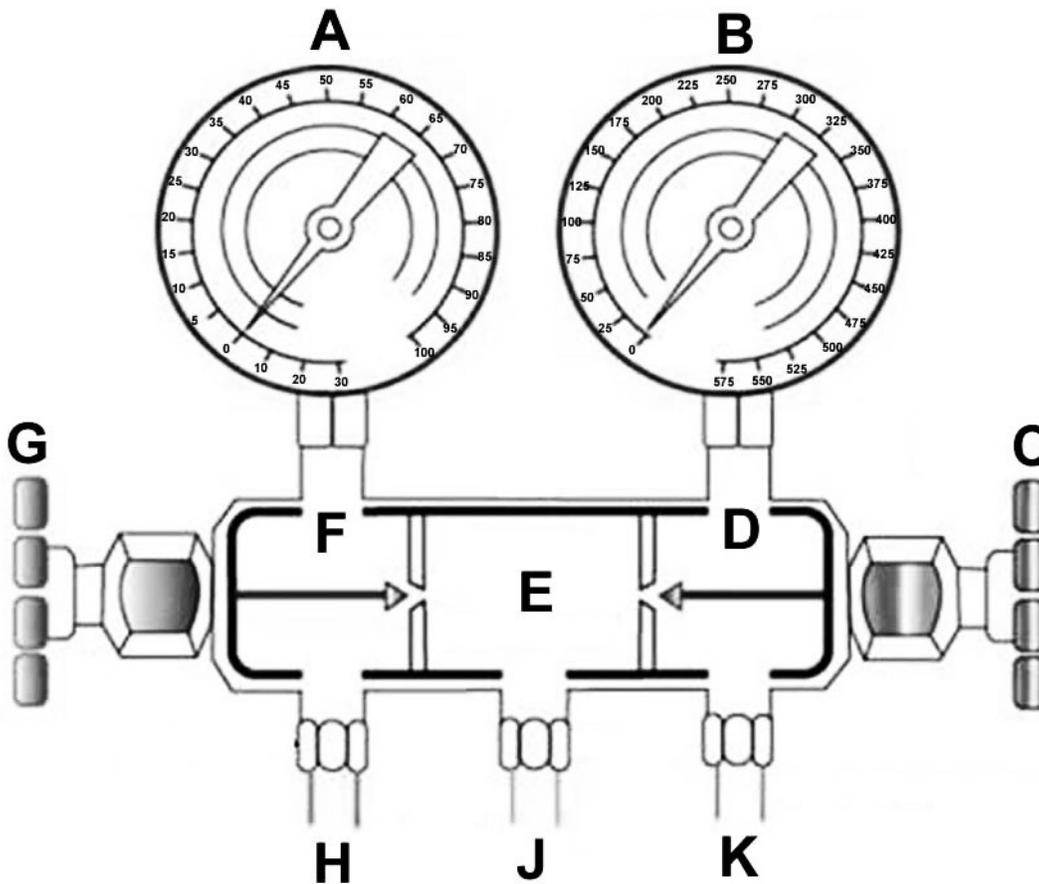


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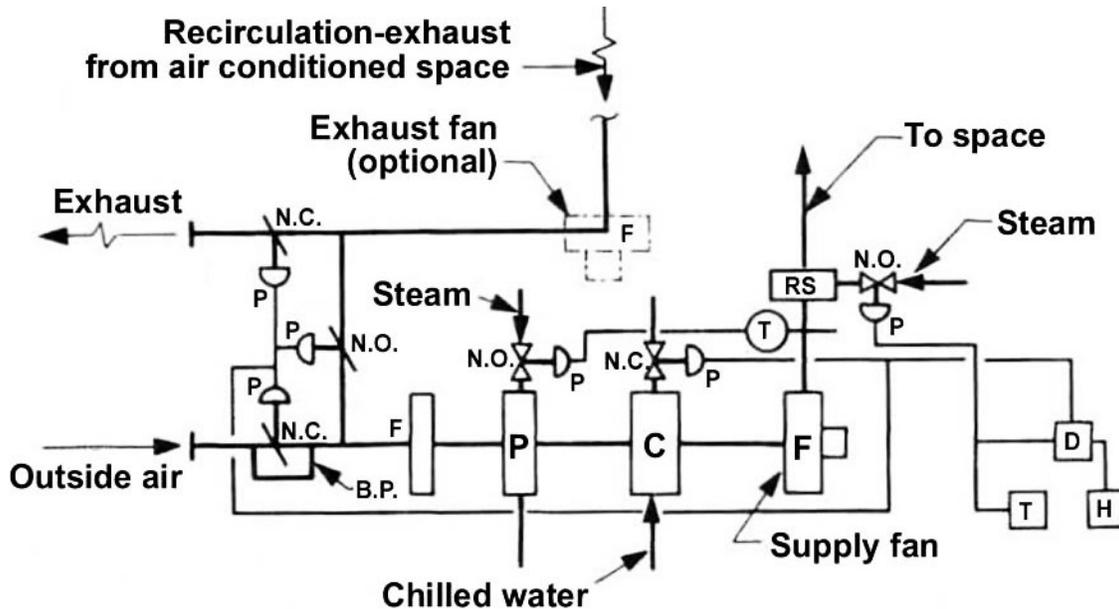
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## GS-RA-01



## GS-RA-09



### Legend

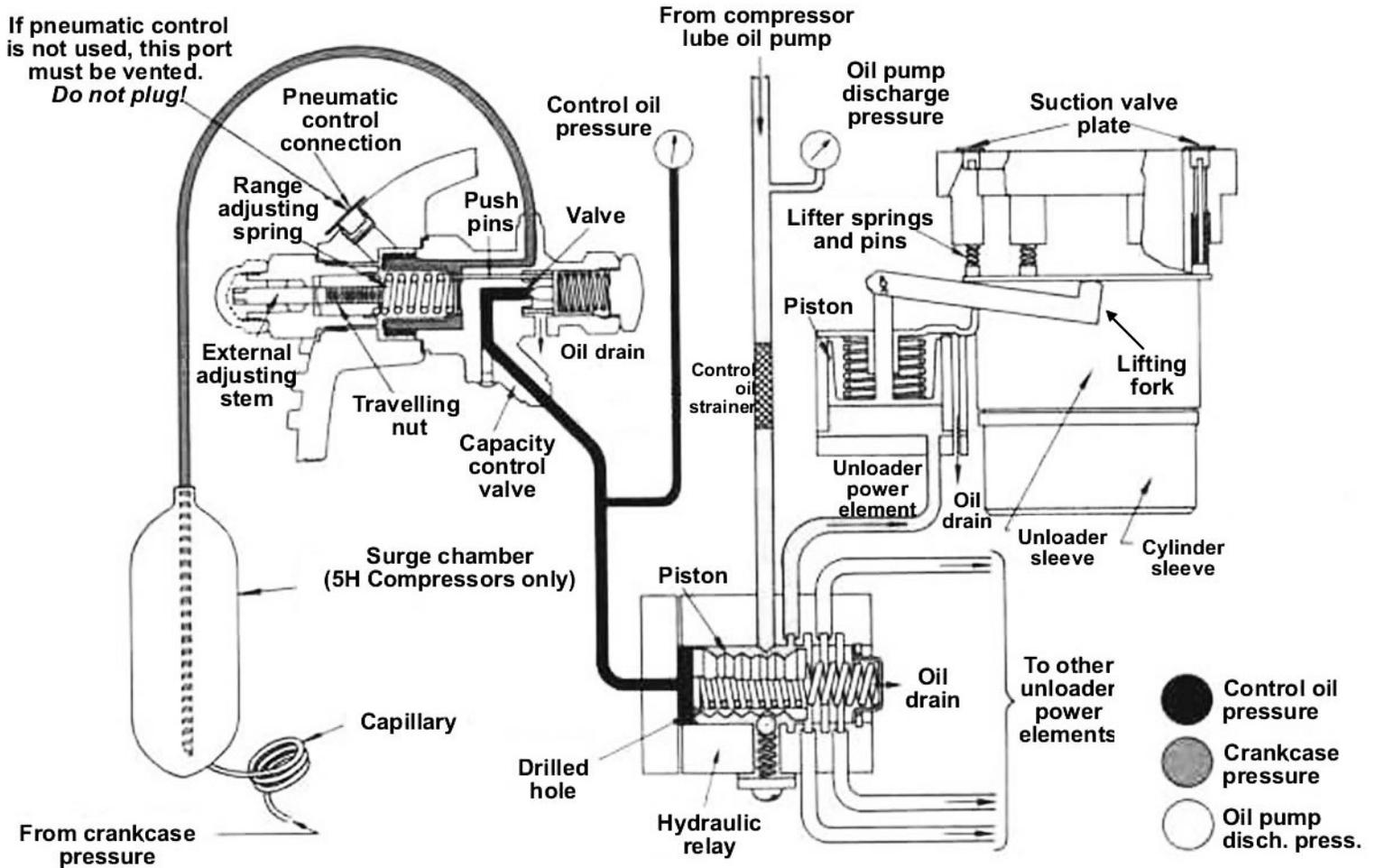
<b>[H]</b> Humidistat	<b>[T]</b> Room thermostat
<b>[F]</b> Fan	<b>[M]</b> Dual duct air mixing unit
<b>F</b> Filter	<b>⊗</b> Pneumatic damper & motor
<b>[C]</b> Cooling coil	<b>M</b> Master
<b>[P]</b> Preheater (steam)	<b>SM</b> Sub-master
<b>[R]</b> Reheater (W=water, S=steam)	<b>P</b> Positive positioning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

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## GS-RA-13

### Capacity Control System

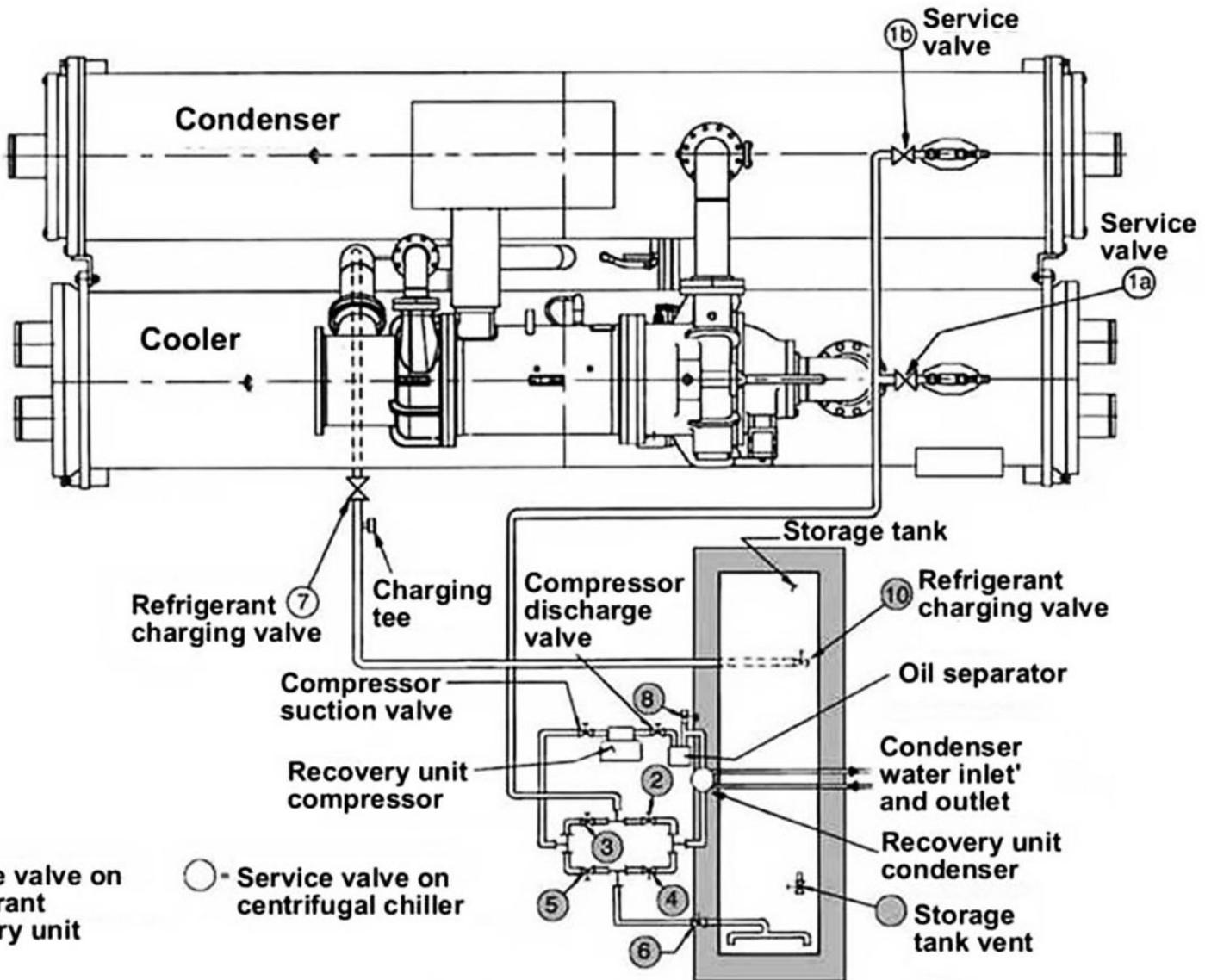


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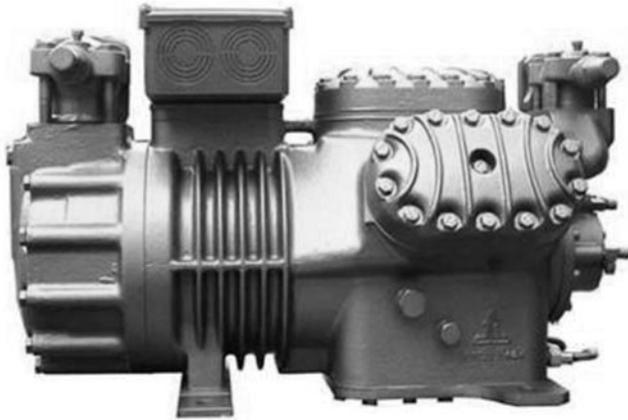
## GS-RA-28



## Centrifugal Chiller Refrigerant Recovery Circuit

Adapted for testing purposes only 19XRT Hermetic Centrifugal Liquid Chillers  
Start-Up, Operation, and Maintenance Instructions  
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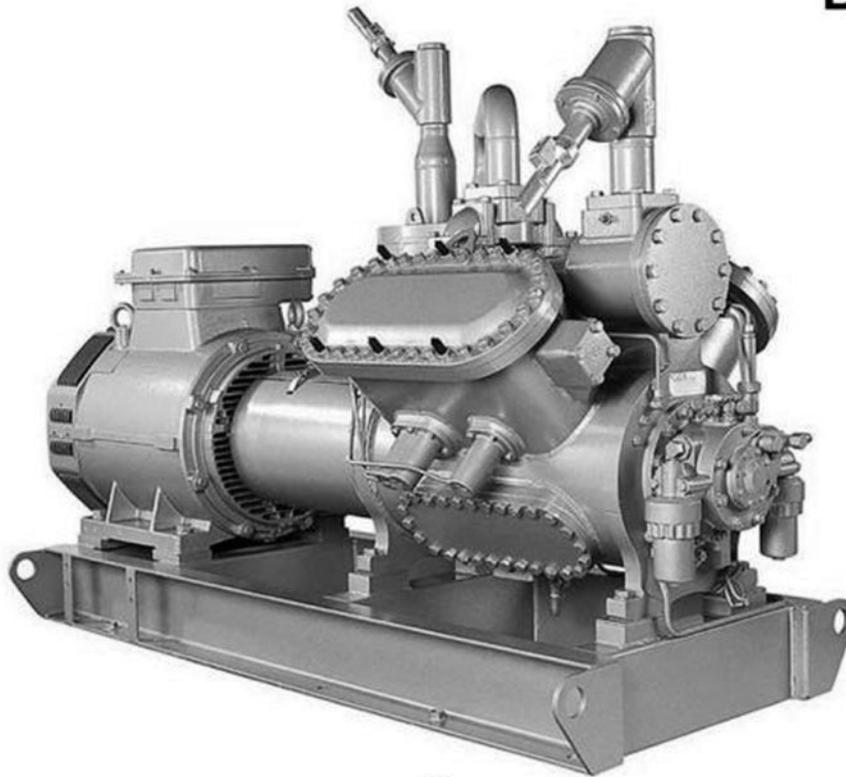
## GS-RA-41



**A**

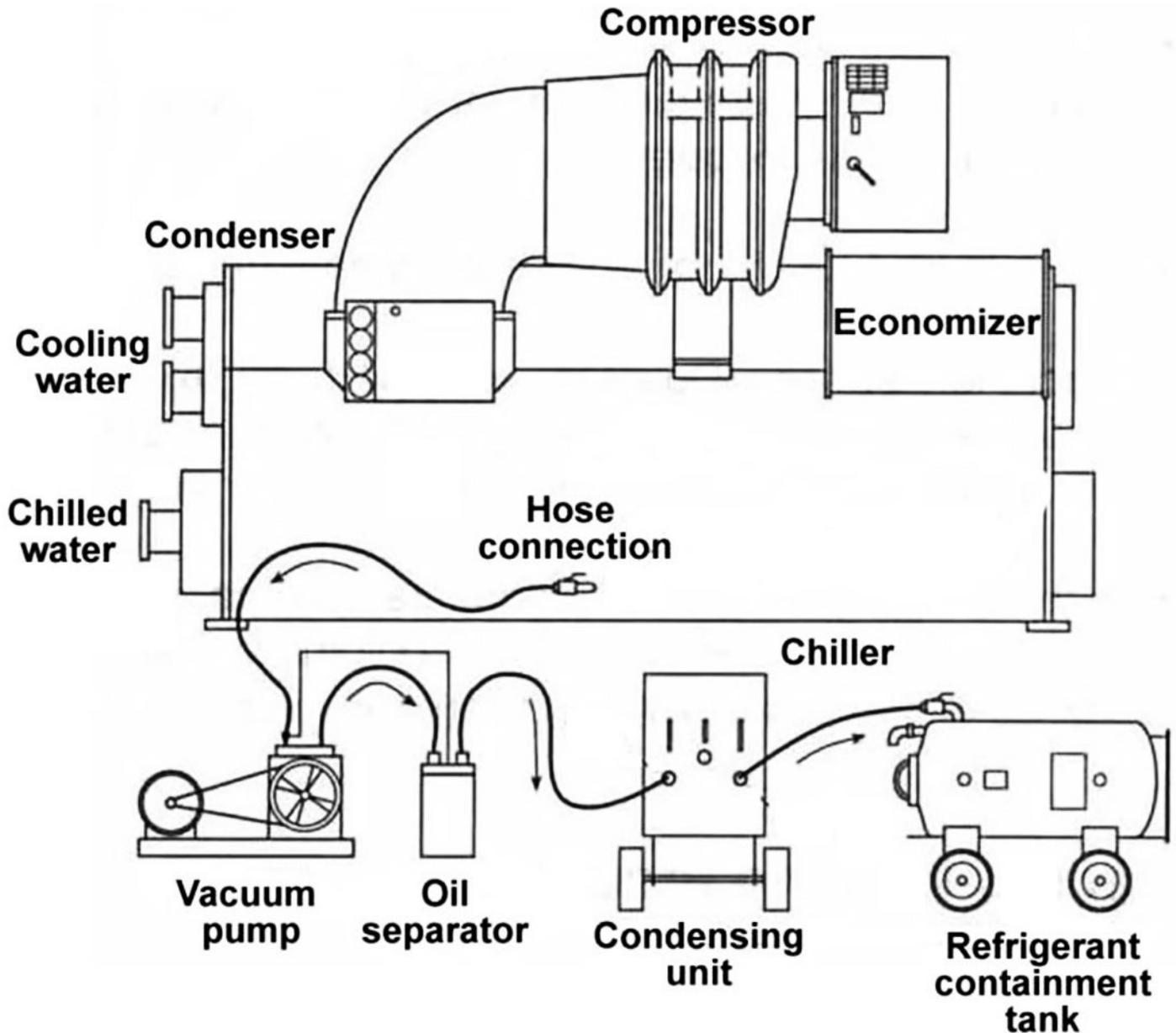


**B**



**C**

## GS-RA-59



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