U.S.C.G. Merchant Marine Exam

Chief Engineer – Limited

Q601 General Subjects

(Sample Examination)

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

1. Lint from cleaning rags can be harmful to hydraulic systems because the lint _____.

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

   Correct answer: D

2. 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

   Correct answer: B

3. While starting a hydraulic anchor windlass, you observe that hydraulic pressure does not develop in spite of the proper operation of the electric drive motor. Which of the following actions should you take FIRST to restore pressure?

   A. Make certain that the hydraulic reservoir is filled to the proper level.
   B. Check for full voltage supply to the electric motor.
   C. Check the electric motor for an open overload relay contact.
   D. Inspect the disc brake on the electric motor for proper operation.

   Correct answer: A

4. Air trapped in the hydraulic fluid of a steering system may be indicated by _____.

   A. a constantly occurring improper rudder response
   B. a jammed open relief valve
   C. excessive ram pressure
   D. the steering pumps overspeeding

   Correct answer: A

5. 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

   Correct answer: A

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

   A. waste oil outlet line
   B. oily bilge water inlet line
   C. processed water outlet line
   D. clean water inlet line

   Correct answer: B

7. 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 upper oil/water interface detection probe fails to end the oil discharge mode.
   D. The lower oil/water interface detection probe fails to initiate the oil discharge mode.

   Correct answer: B

8. 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

9. The process of grinding, shredding, or reducing the size of sewage particles is known as _____.

   A. detention
   B. maceration
   C. bulking
   D. chlorinating

   Correct answer: B

10. Suppose a temperature transmitter has an input range from 0 to 100 degrees Celsius and an output range of 4 to 20 milliamps. Assuming that the transmitter has a linear response pattern, what is the output current in milliamps if the input temperature is 40 degrees Celsius?

    A. 6.40 mA
    B. 10.40 mA
    C. 13.60 mA
    D. 16.00 mA

    Correct answer: B

11. 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 rate at which the error is changing.
    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 gain.

    Correct answer: B

12. In a closed-loop process control system, what is meant by gain?

    A. The undesirable characteristic in which the error of a control system oscillates with constant or increasing amplitude.
    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 signal in a controller that is obtained by subtracting the measured value of the controlled value from the setpoint.

    Correct answer: B

13. 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 output 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 setpoint and input.

    Correct answer: B

14. 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. Controller process output span is 0-250 psi.
    B. Controller input ranges are 0-40 mA and 0-15 psi.
    C. Output process range is 0-250 psi.
    D. Output process span is 200 psi.

    Correct answer: D

15. Who is responsible for ensuring that someone is assigned to close the watertight doors in an emergency?

    A. Chief Mate
    B. Coast Guard
    C. Chief Engineer
    D. Master of the vessel

    Correct answer: D

16. The unlicensed crew requirements listed on the Certificate of Inspection reads as follows: 3 firemen/water tenders; 3 oilers. The vessel is about to depart on a foreign voyage, and has in the crew: 3 firemen/water tenders, 2 oilers, and one man, whose merchant mariner's document is endorsed QMED, any rating. You should _____.

    A. check if any of the firemen have enough time for an oiler's endorsement
    B. sail because your crew requirements are filled
    C. call the port captain and request another oiler
    D. request a waiver from the Coast Guard

    Correct answer: B

17. A trainee is on board your vessel and will need to be assessed in the demonstration of practical skills. Ideally you should assess their skill _____.

    A. after they have observed the skill demonstrated once
    B. after they have received training and personally practiced the skill
    C. before they have received training
    D. immediately after they have received training

    Correct answer: B

18. A water line ruptures under pressure and floods the engine room causing $30,000(USD) damage to the machinery. By law, this must be reported to the _____.

    A. insurance underwriter
    B. engine manufacturer
    C. U.S. Coast Guard
    D. owner or his agent

    Correct answer: C

19. 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

20. 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

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

    Correct answer: C

22. 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 are hung from the underside of 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.

    Correct answer: A

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

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

    Correct answer: A

24. Referring to the illustrated dual duct multiple zone HVAC system, how is the space temperature directly controlled? Illustration RA-0043

    A. The space air temperature is controlled by automatically proportioning the cold and hot air streams at the mixing unit.
    B. The space air temperature is controlled by automatically controlling the chilled water flow through the cooling coil.
    C. The space air temperature is controlled by automatically controlling the steam flow through the reheat coil.
    D. The space air temperature is controlled by automatically controlling the steam flow through the preheat coil.

    Correct answer: A

25. In the illustrated terminal reheat multiple zone system, what statement represents the functioning of the summer outside air duct thermostat? Illustration RA-0042

    A. During the cooling season, the summer thermostat senses the inside air temperature and opens the exhaust and outside air dampers when the inside air temperature is significantly higher than typical indoor air temperatures.
    B. During the cooling season, the summer thermostat senses the inside air temperature and closes the exhaust and outside air dampers when the inside air temperature is significantly higher than typical indoor air temperatures.
    C. During the cooling season, the summer thermostat senses the outside air temperature and opens the exhaust and outside air dampers when the outside air temperature is significantly higher than typical indoor air temperatures.
    D. During the cooling season, the summer thermostat senses the outside air temperature and closes the exhaust and outside air dampers when the outside air temperature is significantly higher than typical indoor air temperatures.

    Correct answer: D

26. What statement is true concerning a one-pipe hydronic heating system?

    A. Each heating coil inlet temperature is identical, as the hot water inlet temperature to each heating coil progressively rises as the water passes through each successive series-connected coil.
    B. Each heating coil inlet temperature is identical, as the hot water inlet temperature to each heating coil progressively drops as the water passes through each successive series-connected coil.
    C. Each heating coil inlet temperature is different, as the hot water inlet temperature to each heating coil progressively drops as the water passes through each successive series-connected coil.
    D. Each heating coil inlet temperature is different, as the hot water inlet temperature to each heating coil progressively rises as the water passes through each successive series-connected coil.

    Correct answer: C

27. Referring to the illustrated psychrometric chart, under what conditions are the dry bulb, wet bulb, and dew point temperatures for air all equal in value? Illustration RA-0022

    A. When the relative humidity is 0%
    B. When the air is completely saturated with moisture and the relative humidity is 100%
    C. When the grains of moisture per pound of dry air is zero
    D. It is impossible for the dry bulb, wet bulb, and dew point temperatures to be the same value.

    Correct answer: B

28. What form of communication provides the greatest information richness, which is the amount of verbal and non-verbal information that a communication channel carries?

    A. Telephone conversation
    B. One-on-one, face-to-face
    C. Large-group meeting
    D. Small-group meeting

    Correct answer: B

29. In order to establish a good climate for communication it is important to minimize status barriers. Which of the following techniques would be the best way to minimize status barriers on a one-on-one, face-to-face conversation of a sensitive nature with an employee?

    A. Conversing with the employee in his/her workspace or a neutral area without regard to being interrupted
    B. Conversing with the employee in his/her workspace or a neutral area with privacy assured
    C. Conversing with the employee in the ship's office with the employee sitting on the opposite side of the desk from you
    D. Conversing with the employee in your office with the employee sitting on the opposite side of the desk from you

    Correct answer: B

30. When removing roller bearings from a shaft, the force of the puller should be applied to the bearing _____.

    A. outer race
    B. raceway
    C. retainer plate
    D. inner race

    Correct answer: D

31. A dented race in an antifriction bearing could be caused by _____.

    A. dirt in the bearing
    B. water in the bearing
    C. vibration while the bearing is not in operation
    D. abrasives in the lubricant

    Correct answer: C

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

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

    Correct answer: A

33. Leadership style sometimes must change with the readiness level of the employees. Which of the following employee readiness level scenarios would be best suited for adopting a delegating leadership style?

    A. Where the employees are able and willing or confident
    B. Where the employees are unable but willing or confident
    C. Where the employees are unable and unwilling or insecure
    D. Where the employees are able but unwilling or insecure

    Correct answer: A

34. During the "storming" phase of group development, conflicts generally arise over goals, task behaviors, and leadership roles. If these conflicts are not successfully resolved, what may result?

    A. The group may not successfully develop teamwork, group cohesion, mutual trust and cooperation, and this probably will interfere with successful accomplishment of the group's mission.
    B. The group will nevertheless successfully develop teamwork, group cohesion, mutual trust and cooperation, but this probably will interfere with successful accomplishment of the group's mission.
    C. The group may not successfully develop teamwork, group cohesion, mutual trust and cooperation, but this should not interfere with successful accomplishment of the group's mission.
    D. The group will nevertheless successfully develop teamwork, group cohesion, mutual trust and cooperation, resulting in successful accomplishment of the group's mission.

    Correct answer: A

35. What statement is true concerning stress and personal psychological makeup of managers and supervisors?

    A. Managers and supervisors are more likely to exhibit type "B" behavior, and this behavior is less likely to subject them to stress over long periods.
    B. Managers and supervisors are more likely to exhibit type "B" behavior, and this behavior is more likely to subject them to stress over long periods.
    C. Managers and supervisors are more likely to exhibit type "A" behavior, and this behavior is less likely to subject them to stress over long periods.
    D. Managers and supervisors are more likely to exhibit type "A" behavior, and this behavior is more likely to subject them to stress over long periods.

    Correct answer: D

36. Of all the individual components of a pre-fire planning package, which component contains information about emergency duty station locations and responsibilities for each crew member by position AND name?

    A. Pre-fire plan
    B. Station bill
    C. Muster list
    D. Fire control plan

    Correct answer: C

37. In accordance with 33 CFR Subchapter O (Pollution), which of the following documents would be the most useful in dealing with a vessel oil spill resulting in a discharge into navigable waters?

    A. Shipboard oil pollution emergency plan
    B. Transfer procedures
    C. Declaration of inspection
    D. Oil record book

    Correct answer: A

38. According to 46 CFR regulations pertaining to tests and inspections as related to automatic auxiliary boilers, the fuel pressure limit control must be checked for proper shutdown operation. What statement is true?

    A. To initiate a safety shutdown, the fuel pressure must be raised to a value above what is required for safe combustion. After the safety shutdown, the boiler is required to restart automatically upon restoration of normal pressure.
    B. To initiate a safety shutdown, the fuel pressure must be lowered to a value below what is required for safe combustion. After the safety shutdown, a manual reset must be required before boiler restart.
    C. To initiate a safety shutdown, the fuel pressure must be lowered to a value below what is required for safe combustion. After the safety shutdown, the boiler is required to restart automatically upon restoration of normal pressure.
    D. To initiate a safety shutdown, the fuel pressure must be raised to a value above what is required for safe combustion. After the safety shutdown, a manual reset must be required before boiler restart.

    Correct answer: B

39. Suppose a water-lubricated stern tube bearing is being evaluated for wear where the propulsion machinery is located aft. If the tail shaft diameter is 13.5 inches, according to 46 CFR regulations pertaining to periodic tests and inspections as related to machinery and equipment, what would be the maximum clearance diameter permissible before the bearing must be re-bushed?

    A. 0.125 inches
    B. 0.25 inches
    C. 0.3125 inches
    D. 0.375 inches

    Correct answer: C

40. You are at a shipyard in dry-dock. New anodes for the impressed current system are being installed. The yard workers are installing the capastic layer on the hull. What is the primary function of the capastic epoxy?

    A. It protects the hull coating from excessive current.
    B. It protects the anode from impact with foreign objects.
    C. It raises the anode off the hull to improve the range of the anode current.
    D. It prevents shorting of the anode current to the hull and aids in a wider current distribution to the hull.

    Correct answer: D

41. What responsibilities does a Senior Officer have while on Builder's Sea Trials of a new vessel to which one will be assigned?

    A. Witness/observe operations and tests, report any perceived discrepancies to regulatory bodies on board.
    B. None operationally, observe/witness tests and document any possible discrepancies to owners' representatives.
    C. Be involved operationally with shipyard operators/crew and report any possible deficiencies to the owner's representatives.
    D. Be involved operationally with the shipyard operating personnel and assist in operations.

    Correct answer: B

42. A vessel you are sailing on as chief engineer had its last dry-docking survey 2 years prior and is not enrolled in an underwater survey program in lieu of dry-docking. When is the next dry-docking due?

    A. 1 year
    B. 6 months
    C. 2 years
    D. 3 years

    Correct answer: A

43. As it pertains to graphical tools used to visualize task scheduling in project management, what statement best represents the difference between a Gantt chart and a PERT chart?

    A. The PERT chart (which is a line diagram) makes it easy to visualize task dependencies and milestones, whereas the Gantt chart (which is a bar chart) makes it easy to visualize progress with respect to an actual calendar.
    B. The Gantt chart makes it easy to visualize task dependencies and milestones, whereas the PERT chart makes it easy to visualize progress with respect to an actual calendar. Both are bar charts.
    C. The Gantt chart makes it easy to visualize task dependencies and milestones, whereas the PERT chart makes it easy to visualize progress with respect to an actual calendar. Both are line diagrams.
    D. The PERT chart (which is a bar chart) makes it easy to visualize task dependencies and milestones, whereas the Gantt chart (which is a line diagram) makes it easy to visualize progress with respect to an actual calendar.

    Correct answer: A

44. If there is any doubt that a newly employed engine department crew member is sufficiently familiar with the engine room equipment, operating and maintenance procedures needed for the proper performance of his or her duties, what should be done?

    A. The employee should be allowed to perform his or her duties without supervision in the hopes that he or she will eventually become familiar enough to be competent.
    B. The employee should be immediately terminated and arrangements made for a relief to be sent out whenever practical.
    C. The employee should be demoted and required to function at the lowest level for the entire duration of his or her assignment.
    D. The employee should be provided a period of close supervision until there is no longer any doubt that he or she is familiar enough to be competent.

    Correct answer: D

45. 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 specifies a performance input condition.
    D. It states a performance by using action words.

    Correct answer: C

46. 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. Develop as many alternatives as humanly possible.
    B. Develop as few alternatives as is feasible.
    C. Develop only one alternative.
    D. The number of alternatives is not an important consideration.

    Correct answer: B

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

    A. Standing orders
    B. Rules
    C. Policies
    D. Regulations

    Correct answer: C

48. What is meant by the term empowering employees?

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

    Correct answer: A

49. What type of managerial control system features strategic control points which measure performance while the activity is taking place?

    A. Feedforward controls
    B. Concurrent controls
    C. Feedback controls
    D. Preventive controls

    Correct answer: B

50. Progressive discipline is discipline that uses a graduated scale of penalties which become progressively more severe each time a particular violation is repeated. What disciplinary action is generally associated with a first offense?

    A. Oral warning documented in personnel file
    B. Written reprimand
    C. Suspension or discharge
    D. Oral warning not documented in personnel file

    Correct answer: D

51. As an engineering department manager in dealing with a grievance presented by an unlicensed engine department crew and union member, what documentation spells out the grievance procedure?

    A. Collective Bargaining Agreement between Company and Union
    B. Shipping Articles of Agreement
    C. Title 46 CFR U.S. Coast Guard (Shipping)
    D. Title 29 CFR Department of Labor

    Correct answer: A

52. You are installing a new refrigeration system aboard your vessel. The system comes with a 240 psi rupture disk, a safety valve set at 240 psi and a pressure gauge connection and gauge. In accordance with 46 CFR, what is the preferred setup for installing the equipment on the condenser?

    A. Safety valve closest to the condenser, then pressure gage then rupture disk in series after the safety valve.
    B. The rupture disk, safety valve, and pressure gauge are all piped in parallel.
    C. Rupture disk closest to the condenser, then pressure gauge then safety valve in series after the rupture disk.
    D. Pressure gauge closest to the condenser, then safety valve then rupture disk in series after the pressure gauge.

    Correct answer: A

53. In accordance with 33 CFR Subchapter O (Pollution), how often must the Oil Record Book be updated with entries?

    A. Entries are to be made on each occasion when an applicable operation is performed.
    B. Entries are to be made on a daily basis if applicable operations are performed during the day.
    C. Entries are to be made on a weekly basis if applicable operations are performed during the week.
    D. Entries are to be made on a monthly basis if applicable operations are performed during the month.

    Correct answer: A

54. As a chief engineer, which of the following instructions would most appropriately be written into the chief engineer's night orders due to the non-routine nature of the special instruction?

    A. When the ship enters congested waters, upon notification from the bridge, the OICEW shall ensure that all machinery involved with maneuvering can be placed in the manual mode of operation.
    B. The OICEW shall notify the chief engineer without delay when the No.1 main feed pump repairs are complete, and it is ready to be put back into service.
    C. When the engine room is in the manned condition, the OICEW shall at all times be readily capable of operating the propulsion equipment in response to needs for changes in direction or speed.
    D. The OICEW shall notify the chief engineer without delay when a malfunction occurs which may be such as to endanger the safe operation of the ship.

    Correct answer: B

55. Prior to entering the navigable waters of the United States after an international voyage, your vessel must conduct drills according to 33 CFR regulations for ports and waterways safety that test steering system functionality and log that in the vessel logbook, unless the drill is conducted and logged on a regular basis at least once every three months. Within how many hours of arrival must these drills be performed?

    A. 6 hours
    B. 12 hours
    C. 24 hours
    D. 48 hours

    Correct answer: D

56. Resonant vibrations, which can cause machinery failure, occur when which of the following conditions happen?

    A. The natural frequency of the machinery is the same as the free vibration frequency.
    B. The frequency of an external vibration is the same as one of the natural frequencies of the machinery.
    C. The machinery is operated at the natural frequency with no external forces in play.
    D. A forced frequency is placed on a piece of operating machinery.

    Correct answer: B

57. Elevated metal levels present in a recent sample of used diesel engine crankcase lubricating oil is indicative of a condition. What would high silicon levels indicate?

    A. The lubricating oil has become contaminated with engine coolant.
    B. The lubricating oil has become contaminated with sand, dust, and dirt.
    C. The lubricating oil's detergent additives have become depleted.
    D. The lubricating oil has become excessively diluted with fuel oil.

    Correct answer: B

58. Which of the following fuel sampling methods would present the most reliable, accurate, and cost-effective option for shipboard use?

    A. Drip method sample
    B. Single grab sample
    C. Proportional extraction sample
    D. Mixture of several grab samples

    Correct answer: C

59. Which of the following comprehensive computerized maintenance system database modules would be used to generate a maintenance due report?

    A. Planned maintenance management module
    B. Equipment management module
    C. Inventory management module
    D. Requisitions management module

    Correct answer: A

60. Which of the following comprehensive computerized maintenance system database modules would contain data such as part numbers and part stowage locations?

    A. Requisitions management module
    B. Inventory management module
    C. Equipment management module
    D. Planned maintenance management module

    Correct answer: B

61. What type of maintenance system would be associated with manufacturer recommendations as a function of machinery running hours?

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

    Correct answer: C

62. Which of the following maintenance criteria would be the basis of condition-based maintenance?

    A. Vibration analysis
    B. Calendar based interval of time
    C. Equipment breakdown
    D. Equipment running hours

    Correct answer: A

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

    A. carbon monoxide
    B. petroleum crystals
    C. phosgene gas
    D. water vapor

    Correct answer: C

64. Personnel servicing refrigeration systems that exposes them to commonly used refrigerants should wear what type of personal protective equipment?

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

    Correct answer: D

65. Which of the projections represents the left side view of the object "X" in the illustration? Illustration GS-0022

    A. A
    B. B
    C. C
    D. D

    Correct answer: A

66. The sectional lines drawn within the flange sections, shown in the illustration, indicate the _____. Illustration GS-0018

    A. direction of machine cutting
    B. fit-up of flange parts
    C. flange surface finish roughness
    D. type of flange material

    Correct answer: D

67. 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

    Correct answer: C

68. 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

69. A hydraulic flow control circuit is shown in the illustration and is known as a _____. Illustration GS-0107

    A. bleed-in circuit
    B. bleed-off circuit
    C. metered-out circuit
    D. metered-in circuit

    Correct answer: B

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

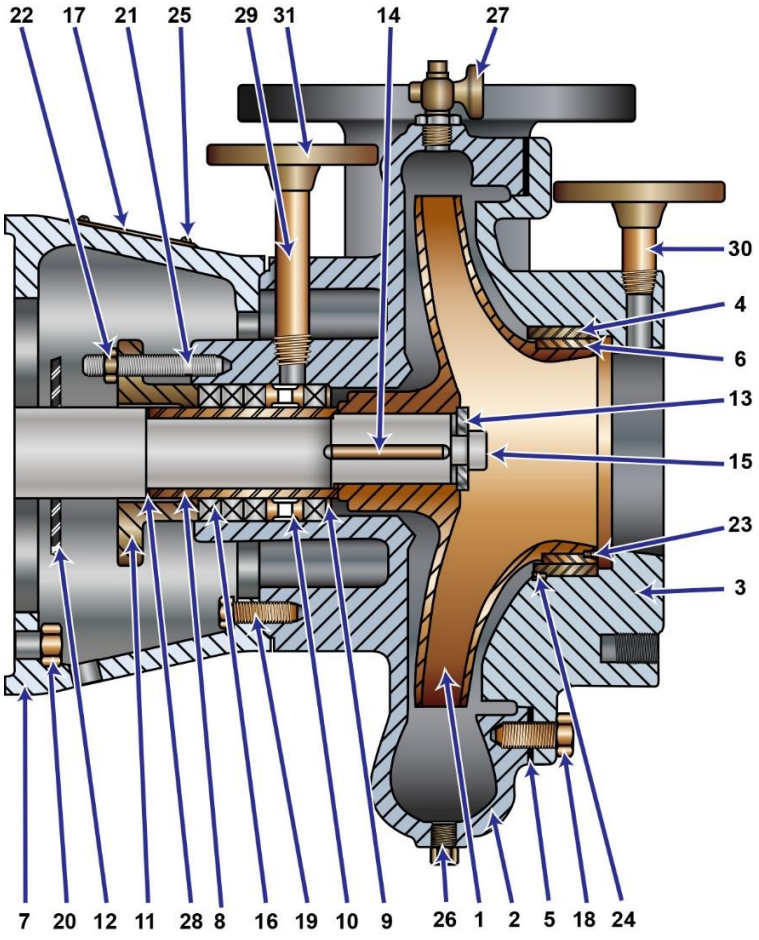
    A. metered-out circuit
    B. bleed-in circuit
    C. bleed-off circuit
    D. metered-in circuit

    Correct answer: D

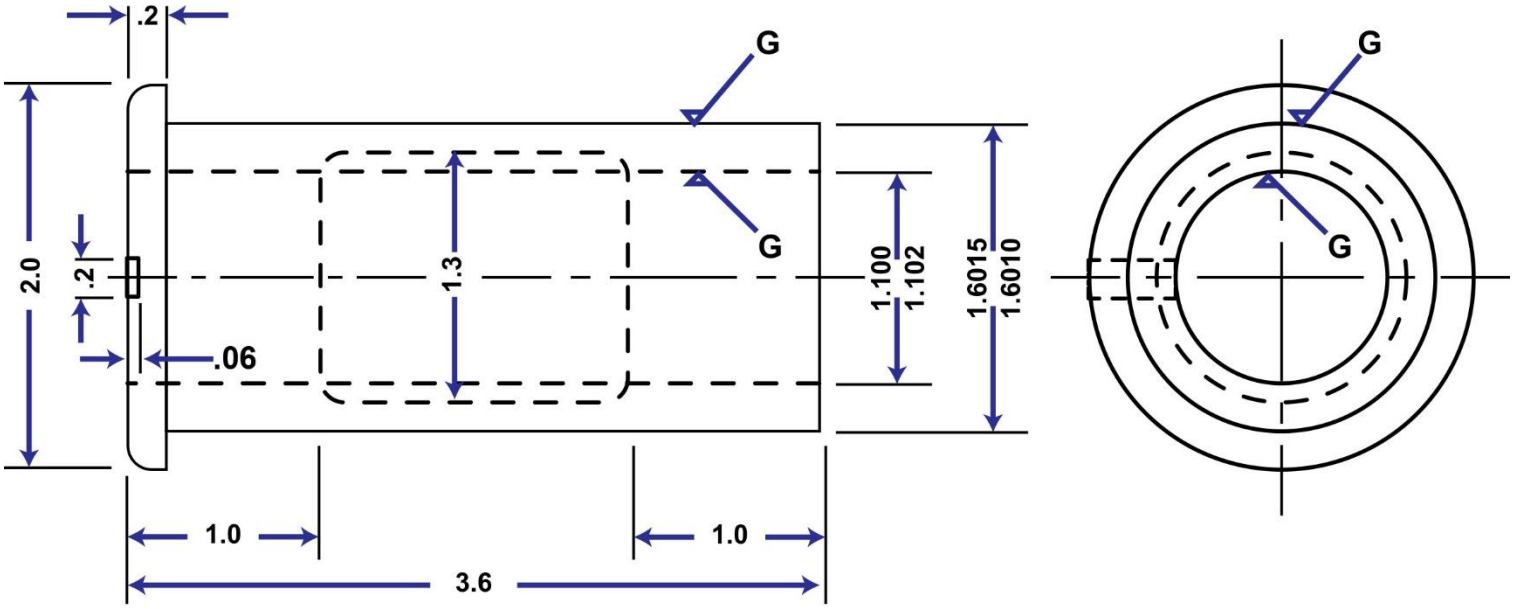
GS-0012

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 ¾ 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	¼ SQ X 2 5/16 TH
15	1	SKT HD Capscrew	SST	½-13 NC X 1¼ LG NYLOCK
16	5	Packing Rings	Plastic Metallic	1¾ 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	½-13 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	½-13 NC X 1 1/4 LG
21	2	Stud	SST	3/8-16 NC X 2½ LG
22	2	Hex Nut	Bronze	3/16-16 2
23	3	Setscrew	NI-CU Alloy	10-24 NC X ¼ LG CUP
24	3	Setscrew	NI-CU Alloy	10-24 NC X ¼ LG CUP
25	4	Drive Screw	Brass	6-24 X ¼ LG
26	3	Pipe Plug	Bronze	¼ NPT
27	1	Vent Valve	Bronze	¼ 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 ¼ NPT
30	1	Pipe	70-30 CU-NI	3 3/16 LG ¼ NPT
31	1	Flange	Valve Bronze	¼ 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

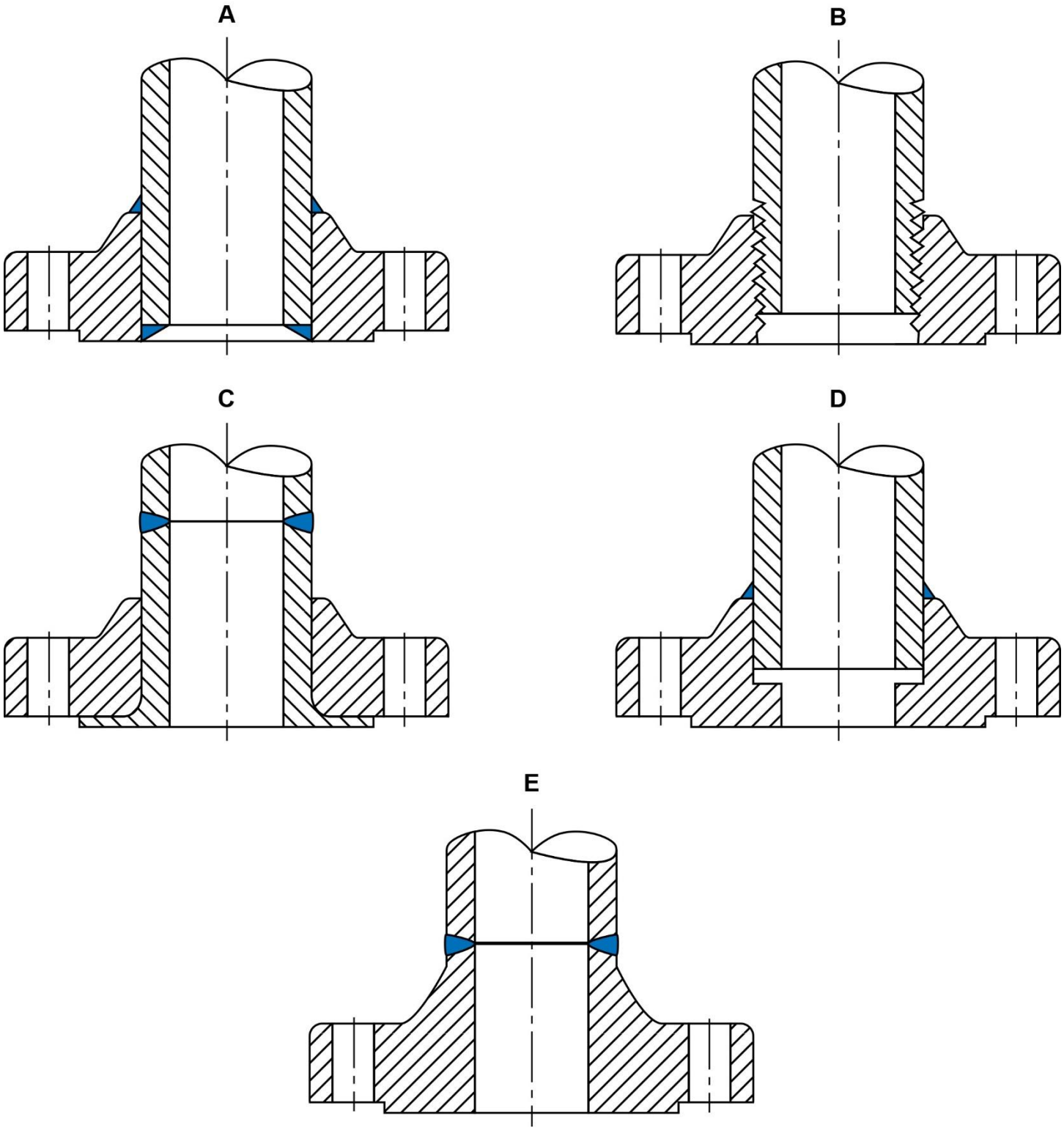


GS-0017

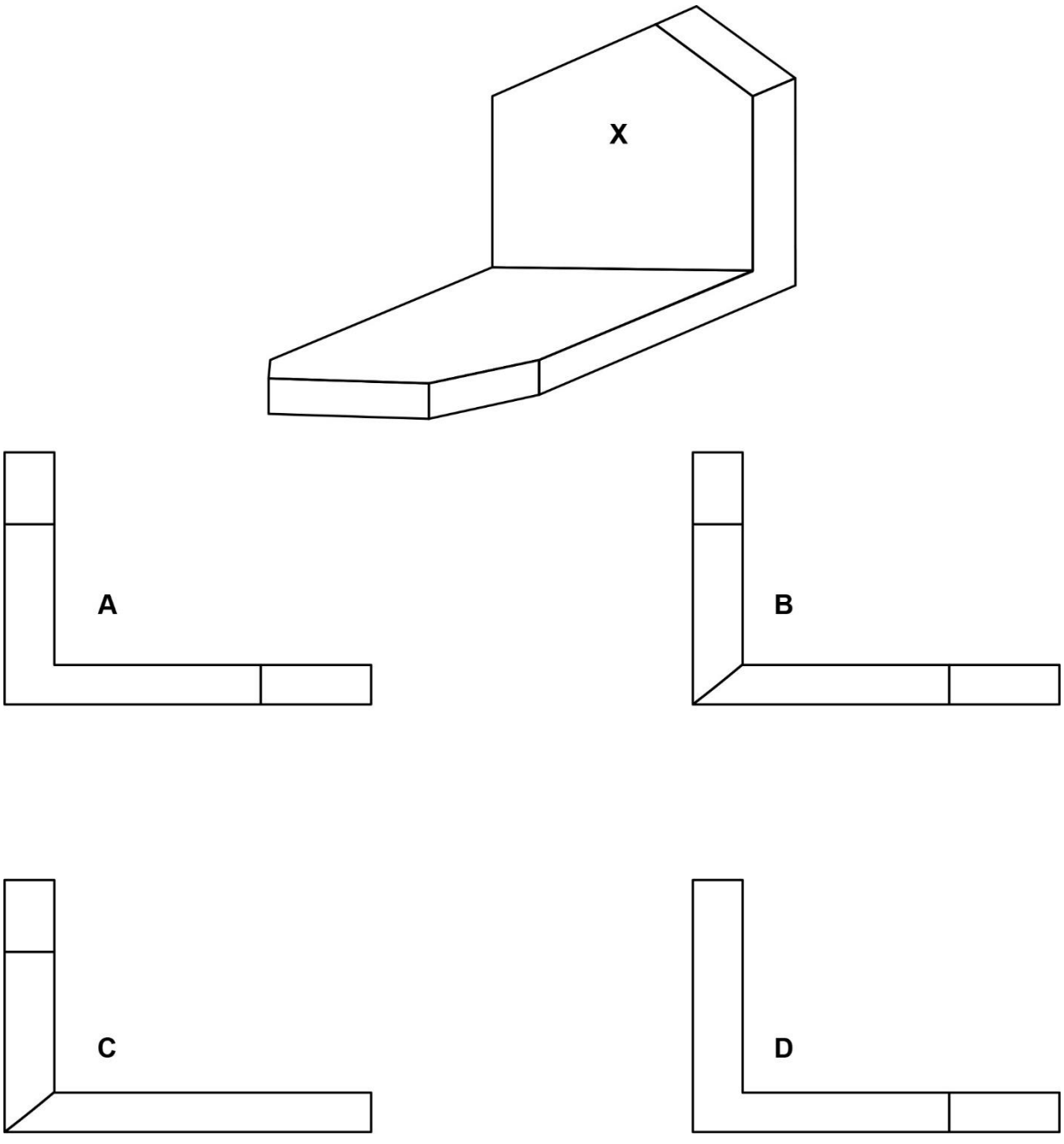


Bushing
AISI 1095 SAE Carbon Steel
Hardened and Tempered
Designated Surfaces Ground
To Specified Tolerances

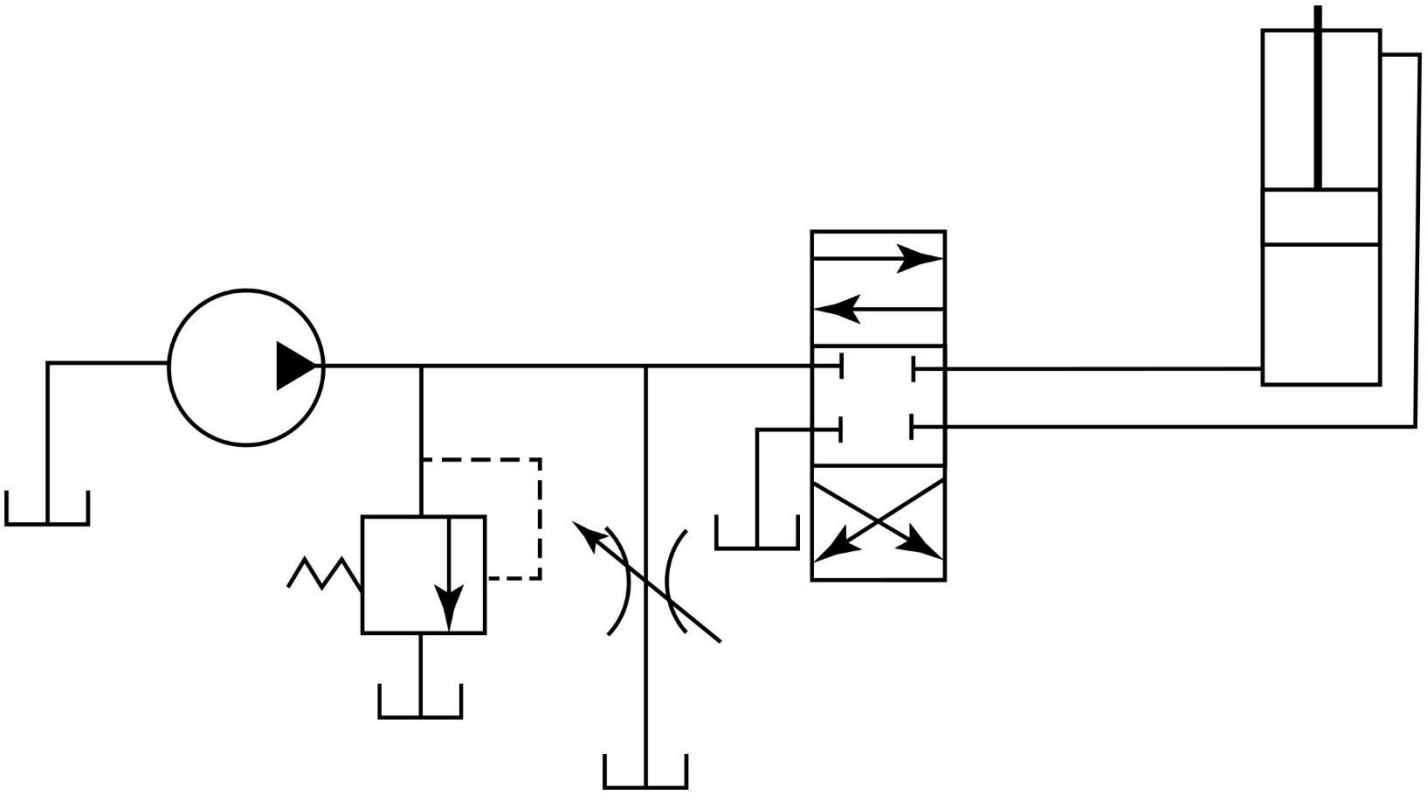
GS-0018



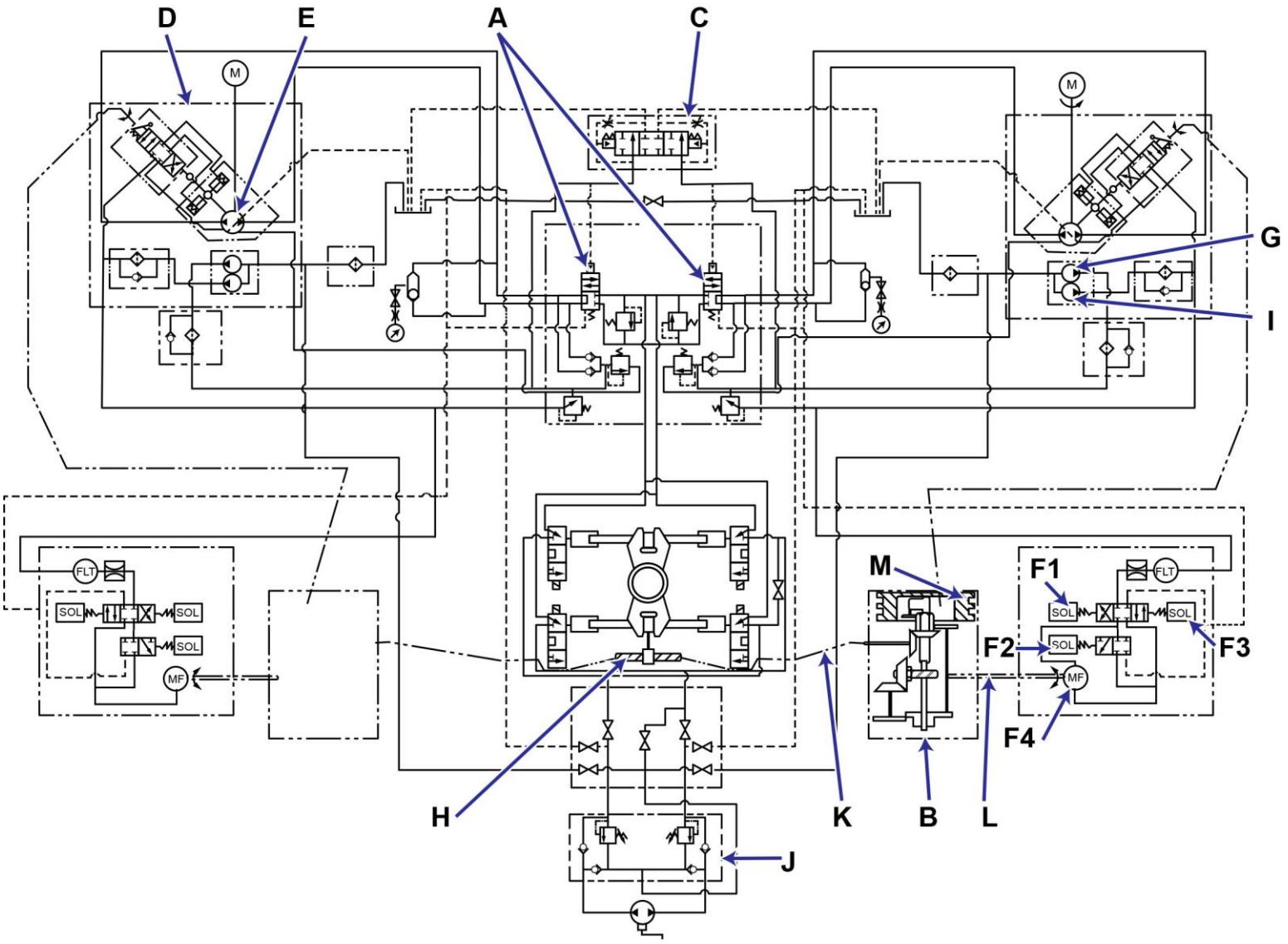
GS-0022



GS-0107



GS-0123



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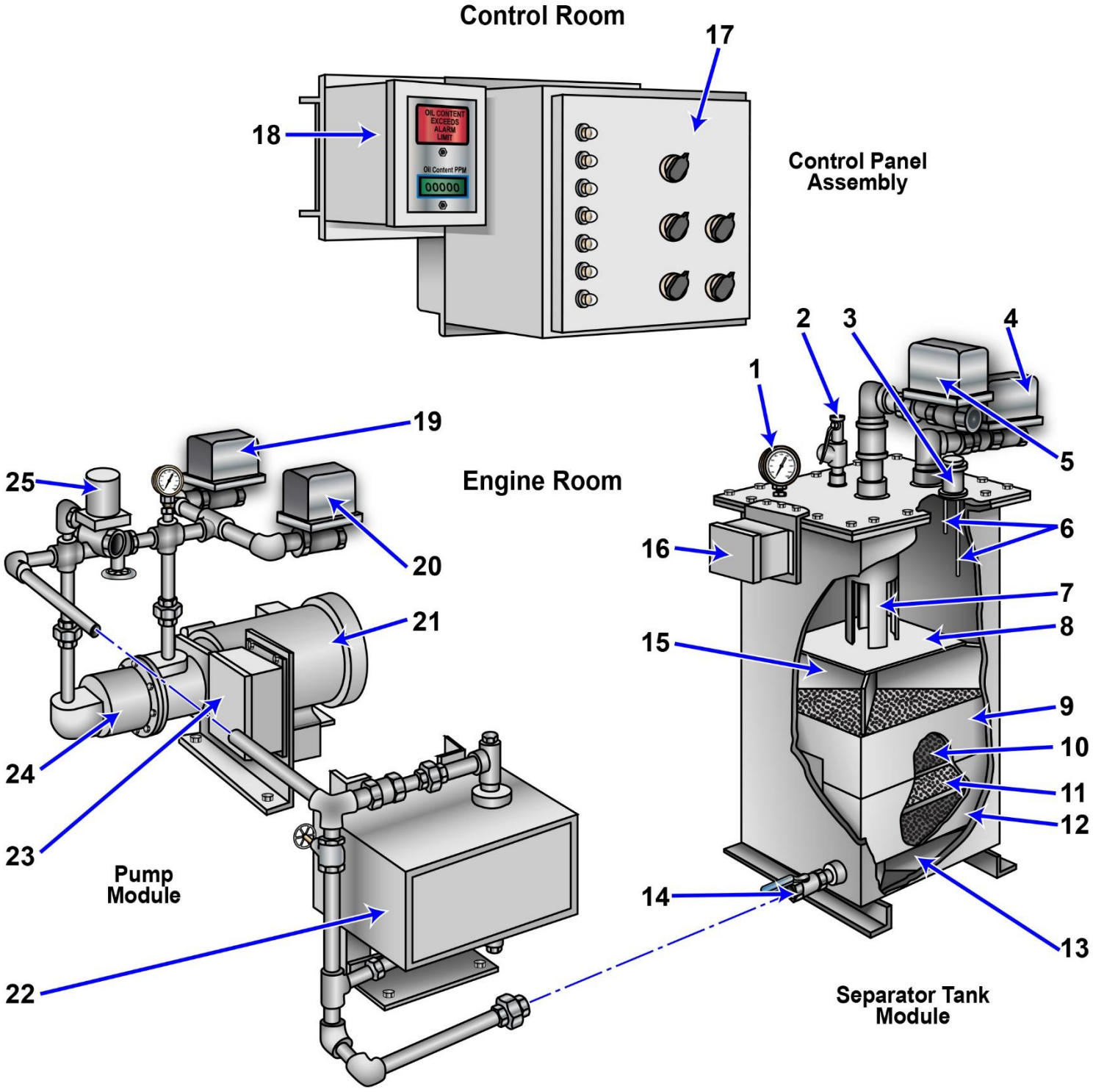
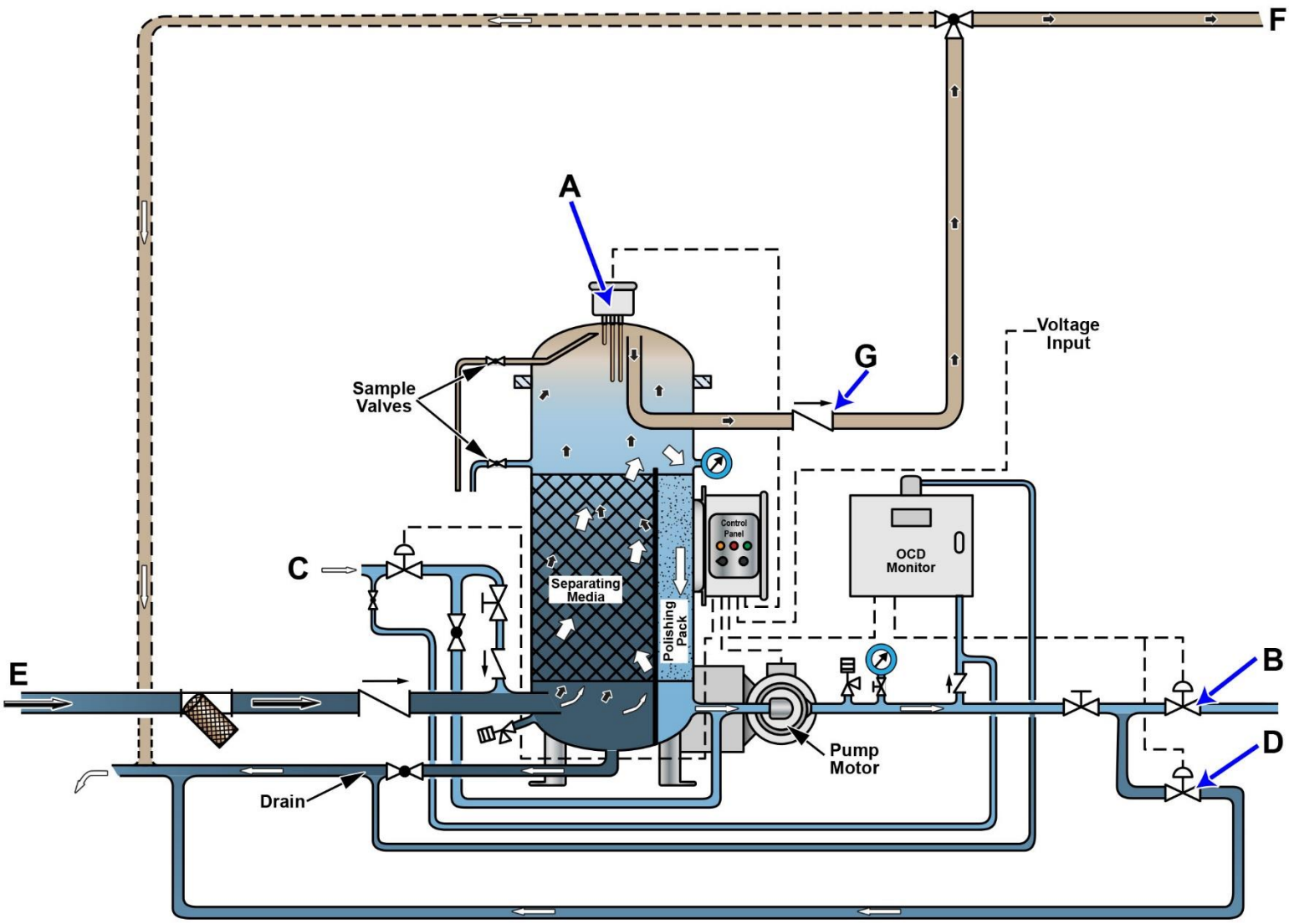


Adapted for testing purposes only from Operator, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Oil Water Separator
TM 55-1925-285-13 & P

GS-0175



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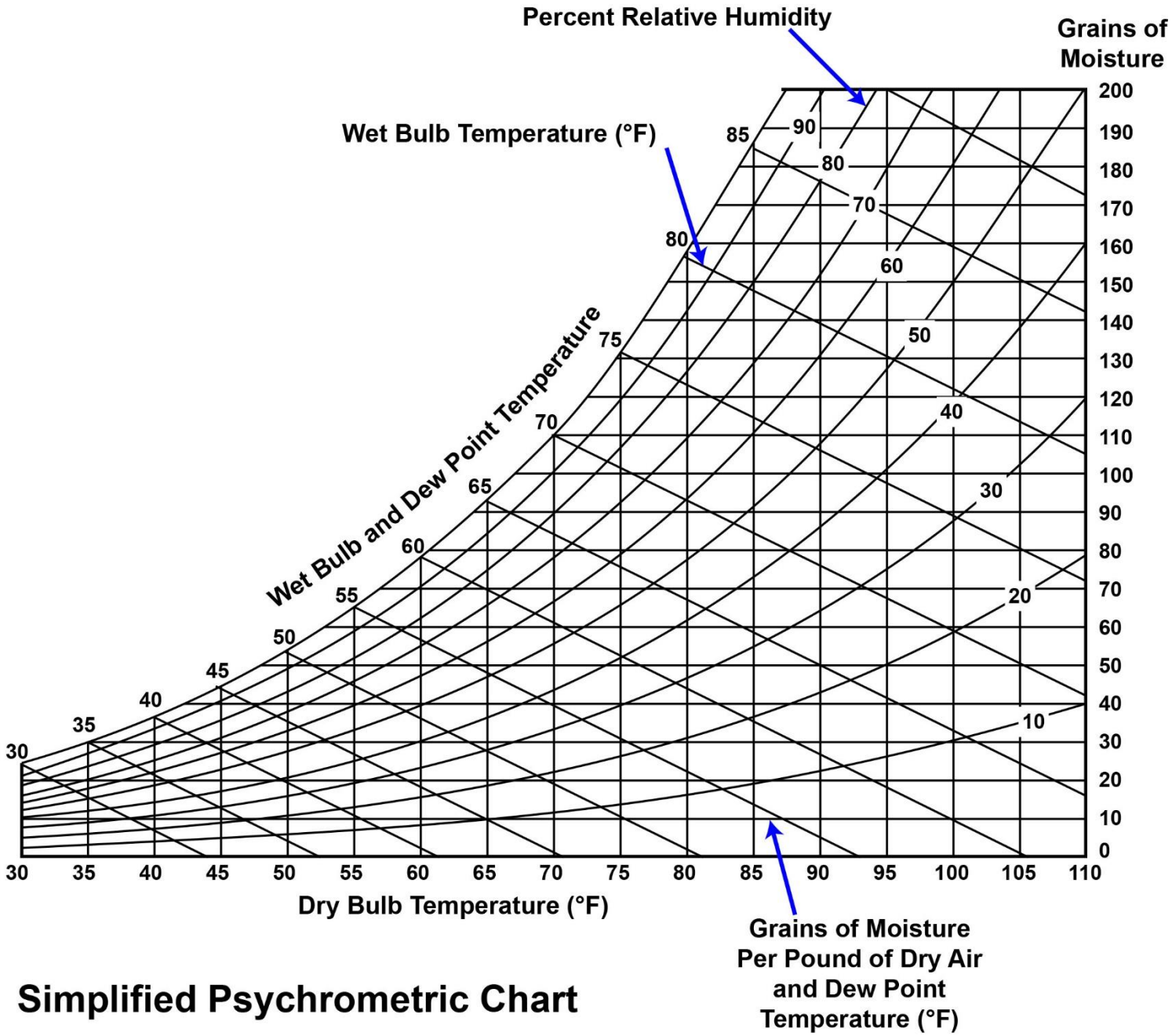
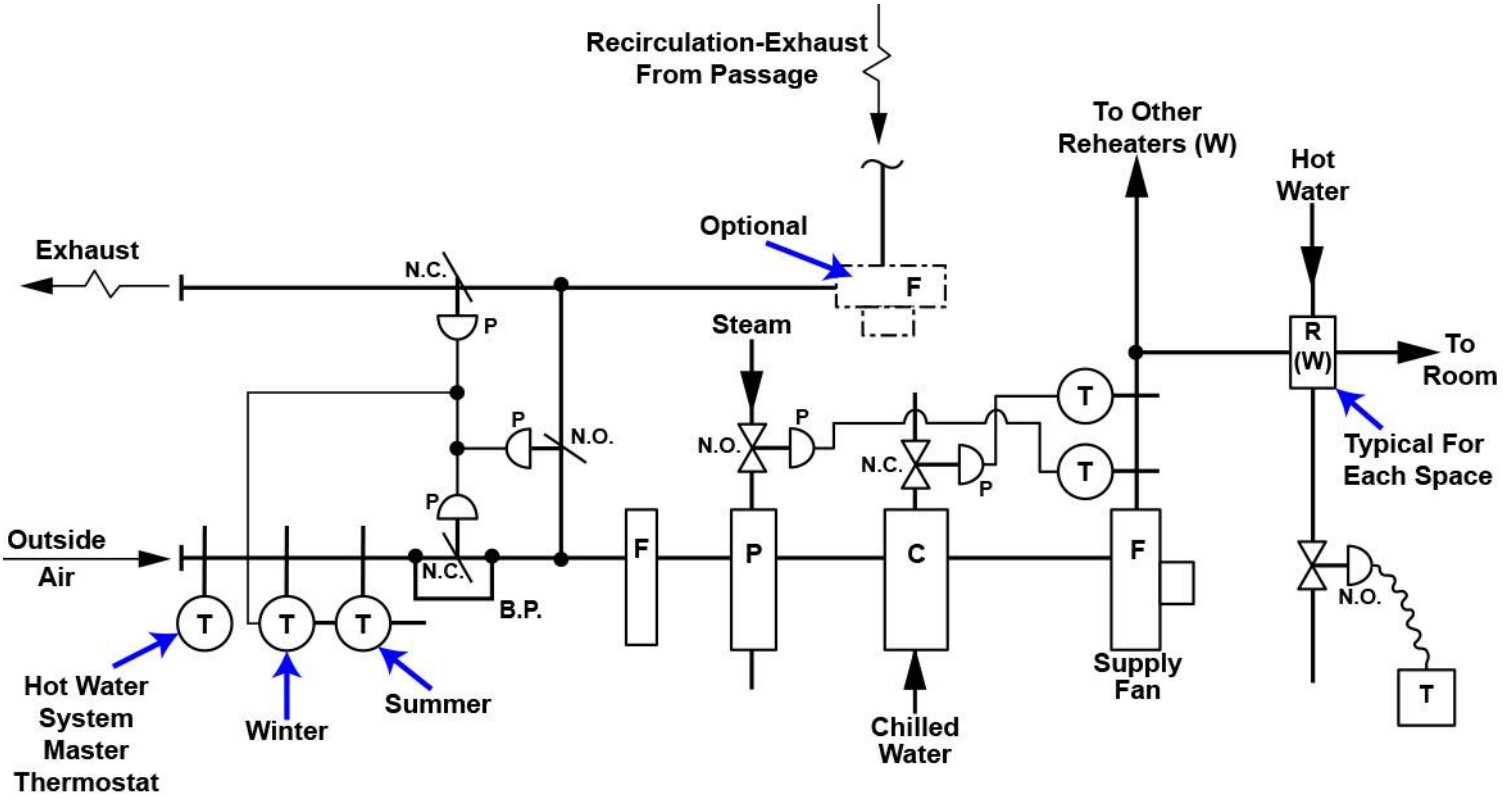


Simplified Psychrometric Chart

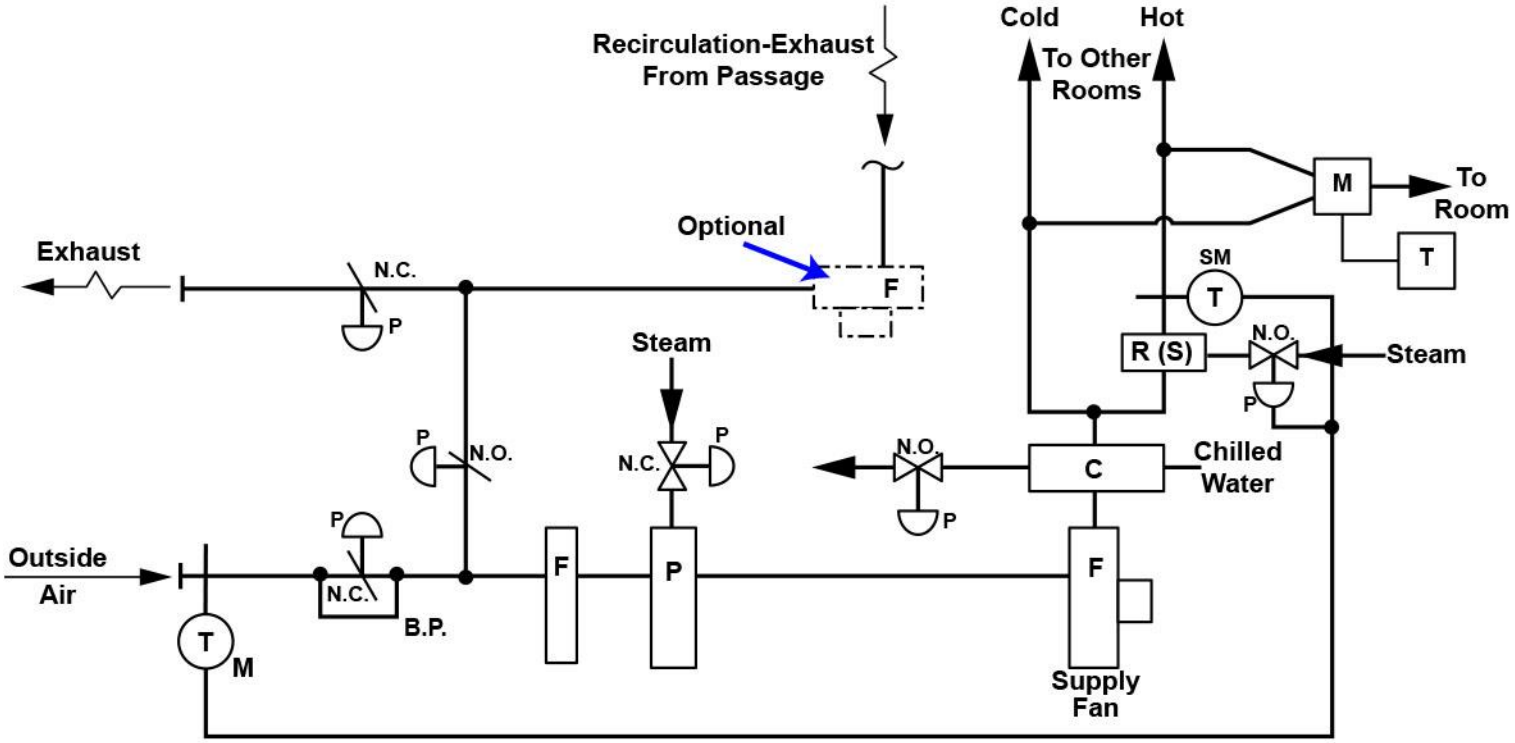
RA-0042



LEGEND

F — Fan	T — Room Thermostat
F — Filter	T — Duct Thermostat
C — Cooling Coil	Pneumatic Damper and Motor
P — Preheater (Steam)	Pneumatic Relay
R (W) — Reheater (Water)	N.C. — Normally Closed (Valve or Damper)
	N.O. — Normally Open (Valve or Damper)
	B.P. — Minimum Outside Air Bypass
	P — Positive Positioning Relay

RA-0043



LEGEND

F	Fan	T	Room Thermostat
F	Filter	T	Duct Thermostat
C	Cooling Coil		Pneumatic Damper and Motor
P	Preheater (Steam)		Pneumatic Relay
R (S)	Reheater (Steam)	N.C.	Normally Closed (Valve or Damper)
M	Dual Duct Air Mixing Unit	N.O.	Normally Open (Valve or Damper)
		B.P.	Minimum Outside Air Bypass
		P	Positive Positioning Relay
		M	Sub-Master
		SM	Master