U.S.C.G. Merchant Marine Exam

UFIV – Chief Engineer

Q697 General Subjects

(Sample Examination)

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

1. 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

   Correct answer: B

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

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

   Correct answer: D

3. A hydraulic fluid flow control circuit, controlling linear actuator speed, with the pump operating below maximum operating pressure is known as the _____.

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

   Correct answer: D

4. In order for the hydraulic pump installed in a constant flow system to maintain adequate flow, the pump suction should _____.

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

   Correct answer: D

5. When new piping sections have been fabricated for installation in a hydraulic system, prior to installation the piping should be _____.

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

   Correct answer: C

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

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

   Correct answer: C

7. If the pump in a hydraulic system produces a low rumbling noise while in operation, this is a probable indication of _____.

   A. air passing through the pump
   B. internal system fluid leakage
   C. excess internal slippage
   D. strained hydraulic fluid

   Correct answer: A

8. If a hydraulic pump is producing a noisy whine when in operation, the cause may be _____.

   A. low viscosity in the hydraulic fluid
   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. an oil leak across the pump shaft packing

   Correct answer: C

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

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

   Correct answer: D

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

    Correct answer: C

11. 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.

    Correct answer: C

12. 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

13. According to the illustration, which of the following conditions would most likely cause Pump "A" to short cycle? Illustration GS-0173

    A. The hydro-pneumatic expansion tank is operating with an insufficient air charge.
    B. The hydro-pneumatic tank is operating with a low water level.
    C. A low water level exists in the potable water storage tank.
    D. Pump "A" wearing rings have excessive clearance.

    Correct answer: A

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

    A. The ratio of the amplitude of the output signal of a component divided by the amplitude of the input signal.
    B. The progressive reduction or suppression of oscillation in a component.
    C. The undesirable characteristic in which the error of a control system oscillates with constant or increasing amplitude.
    D. The signal in a controller that is obtained by subtracting the measured value of the controlled value from the setpoint.

    Correct answer: A

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

    Correct answer: B

16. In a closed-loop process control system, what term is used to describe the undesirable characteristic in which the error of a control system oscillates with constant or increasing amplitude?

    A. Instability
    B. Saturation
    C. Error
    D. Deadband

    Correct answer: A

17. 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. Proportional - component in which there is a linear relationship between setpoint and input.
    B. Proportional - component in which there is a linear relationship between output and input.
    C. Integral - component in which the input is proportional to the output.
    D. Derivative - component in which the input is proportional to the rate of change of the output.

    Correct answer: B

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

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

    Correct answer: D

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

    Correct answer: C

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

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

    Correct answer: B

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

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

    Correct answer: B

22. The gas that exists in the stratosphere forming a protective shield that helps to protect the environment from the harmful effects of ultraviolet radiation is called what?

    A. ozone
    B. oxygen
    C. radon
    D. nitrogen

    Correct answer: A

23. What is the drive arrangement of refrigeration compressor shown in figure "B" of the illustration? Illustration RA-0041

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

    Correct answer: C

24. 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 compressor drive pulley
    B. motor shaft and compressor main bearings
    C. the prime mover drive pulley
    D. the shaft of the prime mover

    Correct answer: B

25. If a refrigeration system, equipped with a reciprocating compressor, has a liquid-line solenoid valve that is leaking during the "off" cycle, what would this cause?

    A. low suction pressure
    B. refrigerant slugs in the receiver
    C. noisy compressor operation upon starting
    D. high superheat in the outlet coil

    Correct answer: C

26. Which of the following statements is true? Illustration RA-0012

    A. Valve "14" is the king solenoid, valve "28" is the chill box solenoid, and valve "36" is the freeze box solenoid.
    B. Valve "14" is the king solenoid, valves "28" and "36" are both freeze box solenoids.
    C. Valve "14" is the king solenoid, valves "28" and "36" are both chill box solenoids.
    D. Valve "14" is the king solenoid, valve "36" is the chill box solenoid, and valve "28" is the freeze box solenoid.

    Correct answer: A

27. To prevent motor overload during start-up of a hermetically sealed centrifugal refrigeration system, what is true concerning the compressor suction gas variable inlet guide vanes?

    A. closed until the motor is connected across the line at full voltage and current drawn is up to full load current
    B. opened until the motor is connected across the line at full voltage and current drawn is below full load current
    C. opened until the motor is connected across the line at full voltage and current drawn is up to full load current
    D. closed until the motor is connected across the line at full voltage and current drawn is below full load current

    Correct answer: D

28. 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. Crankcase pressure regulator
    B. Solenoid valve
    C. High-pressure cutout
    D. Low-pressure cutout

    Correct answer: A

29. Refrigeration systems using forced air circulation evaporators have a tendency to cause rapid dehydration of produce in chill boxes. Which of the following will minimize this dehydration?

    A. the air is circulated slowly over a large evaporator with a minimum temperature differential
    B. the air is circulated rapidly over a small evaporator with a minimum temperature differential
    C. the air is circulated rapidly over a small evaporator with a maximum temperature differential
    D. the air is circulated slowly over a large evaporator with a maximum temperature differential

    Correct answer: A

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

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

    Correct answer: D

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

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

    Correct answer: B

32. Besides the evaporator pressure, the thermal expansion valve reacts directly to changes in what parameter?

    A. temperature of the evaporator coil outlet
    B. liquid refrigerant pressure at the solenoid valve
    C. pressure drop across the evaporator coils
    D. temperature of the space being cooled

    Correct answer: A

33. What maintenance may be carried out on a thermostatic expansion valve?

    A. The inlet screen may be cleaned
    B. The rate action may be increased
    C. The proportional action may be varied
    D. The thermal bulb may be recharged

    Correct answer: A

34. If the needle and seat assembly is excessively eroded, the valve cage assembly can be replaced. In replacing the original valve cage assembly rated at 1/2 tons, what would be the result if the replacement valve cage was oversized at 5 tons? Illustration RA-0007

    A. The evaporator would be starved producing consistently excessive superheat.
    B. The evaporator would be overfed producing consistently insufficient superheat.
    C. The expansion valve would hunt excessively, alternately starving and overfeeding the evaporator coil.
    D. The expansion valve would function normally, with the presentation of no problems.

    Correct answer: C

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

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

    Correct answer: A

36. The assessment of a trainee's practical demonstration of skills should be conducted _____.

    A. only when the trainee first arrives onboard, and preferably within the first few days
    B. within the normal routine of vessel's operation
    C. at any time of the day, particularly outside normal operations
    D. within the last six hours that the trainee will be onboard the vessel

    Correct answer: B

37. 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. request a waiver from the Coast Guard
    C. call the port captain and request another oiler
    D. sail because your crew requirements are filled

    Correct answer: D

38. Technicians servicing small refrigeration appliances can employ what type of recovery equipment?

    A. passive only
    B. active only
    C. either active or passive
    D. do not need to recover the refrigerant

    Correct answer: C

39. Which of the valves listed is normally closed when charging the refrigeration system through the high side?

    A. Dehydrator inlet valve
    B. Liquid line king valve
    C. Suction line valve
    D. Thermal expansion valve

    Correct answer: B

40. For safe storage, the maximum allowable temperature to which refrigerant bottles should be exposed is what temperature?

    A. 100°F
    B. 125°F
    C. 150°F
    D. 175°F

    Correct answer: B

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

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

    Correct answer: C

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

    A. the same refrigerant as the system
    B. bees wax
    C. mercuric sulfate
    D. distilled water

    Correct answer: A

43. Concerning the arrangement of equipment and associated hoses shown in the illustration, which statement is true? Illustration RA-0059

    A. When recovering refrigerant from the centrifugal chiller using this method, the containment tank should be vented back to the chiller evaporator shell.
    B. When recovering refrigerant from the centrifugal chiller using this method, the refrigerant is being recovered as a liquid.
    C. 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.
    D. When recovering refrigerant from the centrifugal chiller using this method, the entire charge may be removed in one procedure.

    Correct answer: C

44. For the proper control of the air temperature in an air conditioning system using chilled water circulation, which of the listed conditions should remain constant regardless of load changes?

    A. Chilled water system supply temperature
    B. Chilled water system return temperature
    C. Compressor suction pressure
    D. Compressor discharge temperature

    Correct answer: A

45. 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 RA-0028

    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

    Correct answer: B

46. When pumping down an air conditioning system to test the low-pressure cutout switch, assuming that the compressor is running, what should be done to initiate the test?

    A. stop the circulating pump
    B. secure the condenser
    C. close the "king" valve
    D. stop the compressor

    Correct answer: C

47. The size of ball and roller bearings can be identified by the _____.

    A. inner race cone width
    B. rolling member size
    C. manufacturer's numerical code
    D. outer ring width

    Correct answer: C

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

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

    Correct answer: C

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

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

    Correct answer: C

50. 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

51. 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

52. 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"

    Correct answer: C

53. 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. prevent both units from operating simultaneously which could result in doubling the flow of oil and pressure leading to over pressurization of the system
    C. allow an alternate main pump to start in the fully loaded condition thus developing immediate full torque
    D. all of the above

    Correct answer: A

54. 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 pedestal-mounted controller?

    A. The pedestal-mounted controller allows both the warping heads and the wildcats to rotate in only one direction of rotation at discrete speeds from zero to maximum.
    B. The pedestal-mounted controller allows the wildcats to rotate in either direction of rotation, but the warping heads in only one direction of rotation at discrete speeds from zero to maximum.
    C. The pedestal-mounted controller allows the warping heads to rotate in either direction of rotation, but the wildcats in only one direction of rotation at discrete speeds from zero to maximum.
    D. The pedestal-mounted controller allows both the warping heads and the wildcats to rotate in either direction of rotation at discrete speeds from zero to maximum.

    Correct answer: D

55. 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 usually older than their subordinates often creates a barrier to open and free communication vertically upward.
    B. The very fact that managers have authority, status and power over 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 are more technically proficient than their subordinates often creates a barrier to open and free communication vertically upward.

    Correct answer: B

56. 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. Supportive, participative leadership style
    B. Transactional leadership style
    C. Hierarchical, dictatorial leadership style
    D. Structured, autocratic leadership style

    Correct answer: A

57. 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 will nevertheless successfully develop teamwork, group cohesion, mutual trust and cooperation, but this probably will interfere with successful accomplishment of the group's mission.
    B. 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.
    C. 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.
    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: C

58. 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. Pre-fire plan
    B. General arrangement plan
    C. Fire control plan
    D. Deadweight and capacity plan

    Correct answer: D

59. If a new assistant engineer reports onboard, ideally, who should conduct the familiarization training specific and relevant to the engineer's routine maintenance and watchkeeping duties?

    A. First assistant engineer
    B. Chief engineer
    C. The 3rd assistant engineer being relieved
    D. The designated ship's training officer

    Correct answer: C

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

    Correct answer: A

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

    Correct answer: A

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

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

    Correct answer: A

63. As a first assistant or chief engineer, what is the source of your authority?

    A. Your authority is earned by you as a function of daily performance.
    B. Your authority is bestowed upon you by its acceptance by your subordinates.
    C. Your authority is conferred upon you by the ship's master upon reporting aboard.
    D. Your authority is conferred upon you by the license you hold and maritime tradition.

    Correct answer: D

64. In setting up a managerial control system, the standard must be established, and a means of measuring performance against that standard must be established. What statement is true concerning the comparison between performance and the standard?

    A. Any deviation must be determined and documented for record-keeping purposes. No further action is necessary.
    B. Any deviation must be determined and analyzed to determine what caused the deviation. No further action is necessary.
    C. Any deviation must be determined and analyzed to determine what caused the deviation. Corrective action is taken as necessary.
    D. Any deviation must be determined. No further action is necessary.

    Correct answer: C

65. A performance appraisal (employee evaluation) is the process used to determine what extent an employee is performing a job in the way that is as intended to be done. Properly done and in the interest of employee development, what should be the focus of the appraisal?

    A. Although it should examine all aspects of past performance, it should be constructive and future oriented with an eye towards the path to improvement.
    B. It should focus only on past performance with an emphasis on shortcomings so that the employee fears for the future.
    C. It should focus on the positive and totally ignore any past shortcomings so that the employee can maintain positive self-esteem.
    D. The appraisal should be conducted without the benefit of an interview as this process often causes discomfort for the employee and the supervisory manager.

    Correct answer: A

66. One of the means of alternative dispute resolution regarding a collective bargaining agreement is arbitration. What is the role of the arbitrator?

    A. The arbitrator conducts independent fact-finding and renders a decision based on the results of that investigation.
    B. The arbitrator makes a binding decision based on the evidence and the arguments presented by both sides.
    C. The arbitrator facilitates settlement by negotiation by working with both sides to reach common ground.
    D. The arbitrator appoints a factfinder from each side to investigate the dispute and report back to the principals.

    Correct answer: B

67. What statement represents the policy that should be implemented in terms of watch officers entering notes while maintaining the engine room logbook?

    A. Notes should be entered for non-routine occurrences and the general time frame of occurrence should be noted (within 4 hours).
    B. Notes should be entered for non-routine occurrences and the actual time of occurrence should be noted.
    C. Notes should be entered for routine occurrences and the actual time of occurrence should be noted.
    D. Notes should be entered for routine occurrences and the general time frame of occurrence should be noted (within 4 hours).

    Correct answer: B

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 axial
    B. Vertical and horizontal
    C. Axial and horizontal
    D. Vertical, horizontal and axial

    Correct answer: D

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

    Correct answer: C

70. Which of the following condition-based maintenance data continuous monitoring techniques has the greatest value in predicting wear?

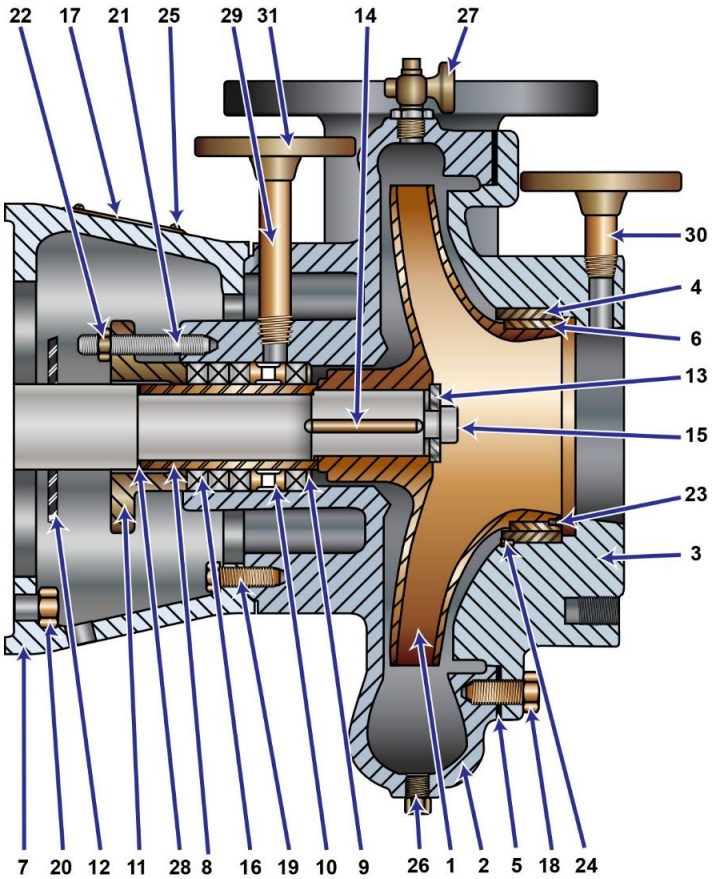
    A. Vibration analysis
    B. Lubricating oil analysis
    C. Thermography
    D. Acoustic analysis

    Correct answer: A

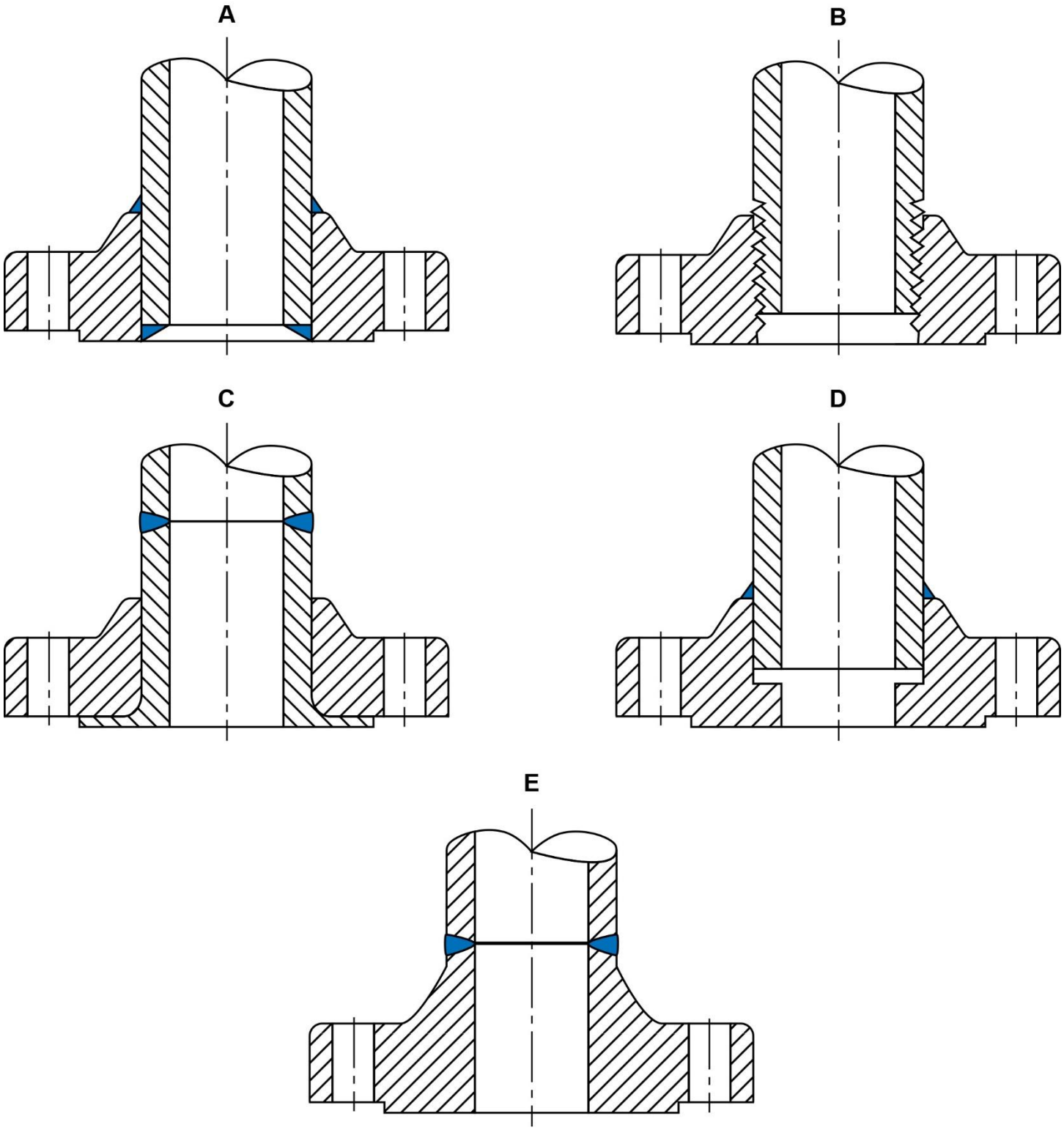
GS-0012

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#

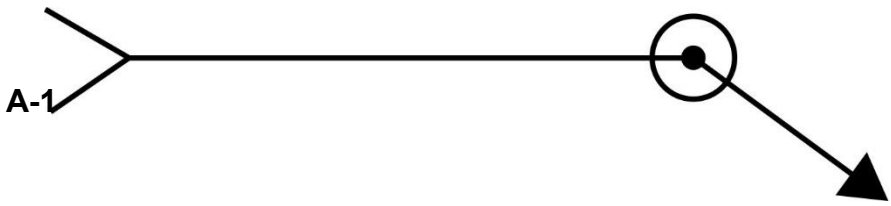
Note: Inside dia. of Wearing Ring, PC No. (4) is .020 undersize outside dia. of Wearing Ring, PC No. (6) is .020 oversize when finished as repair parts and are designated as part No. 5 A3H180A-1 U/S and 3H180-1 O/S



GS-0018



GS-0030



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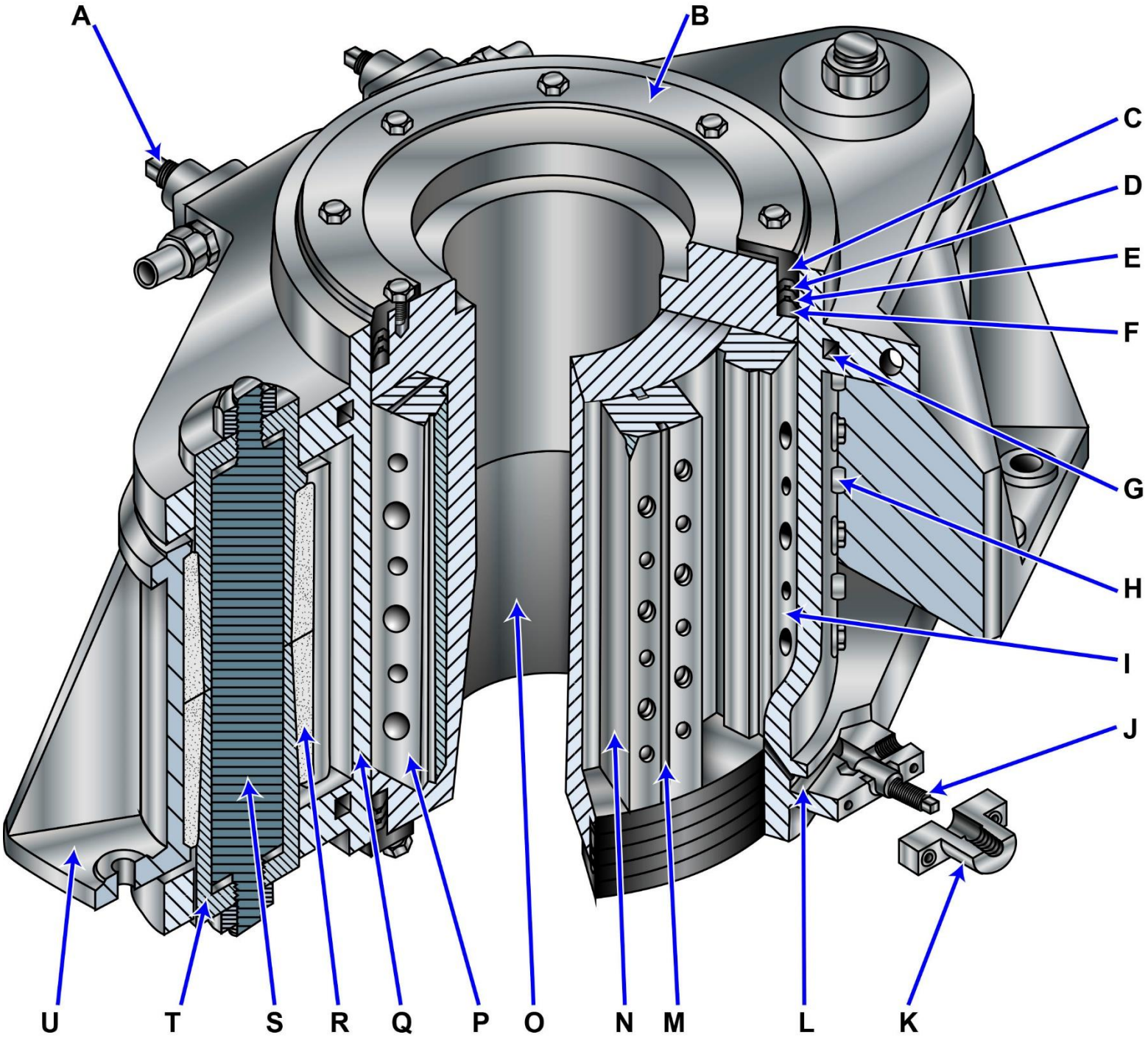

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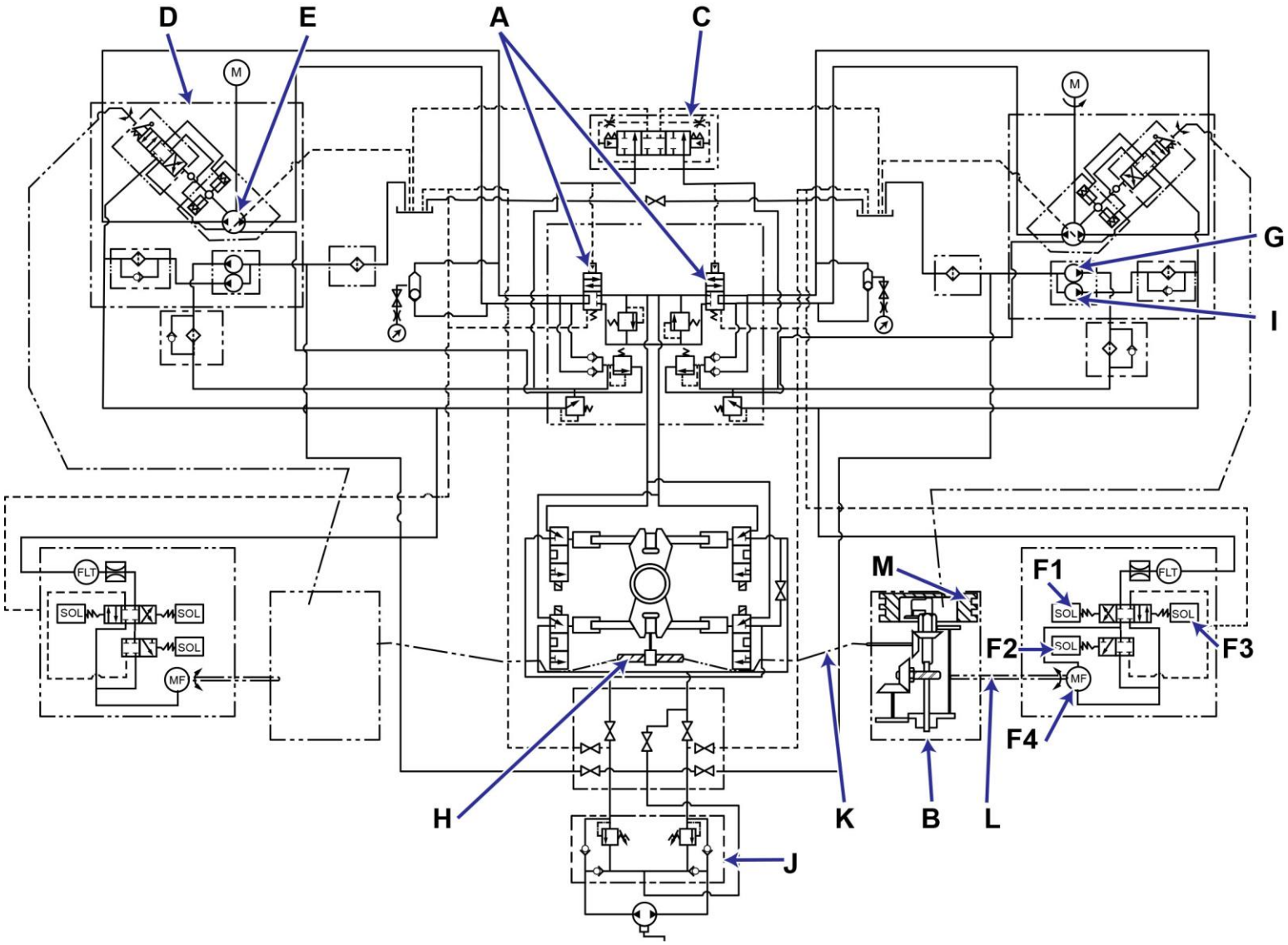

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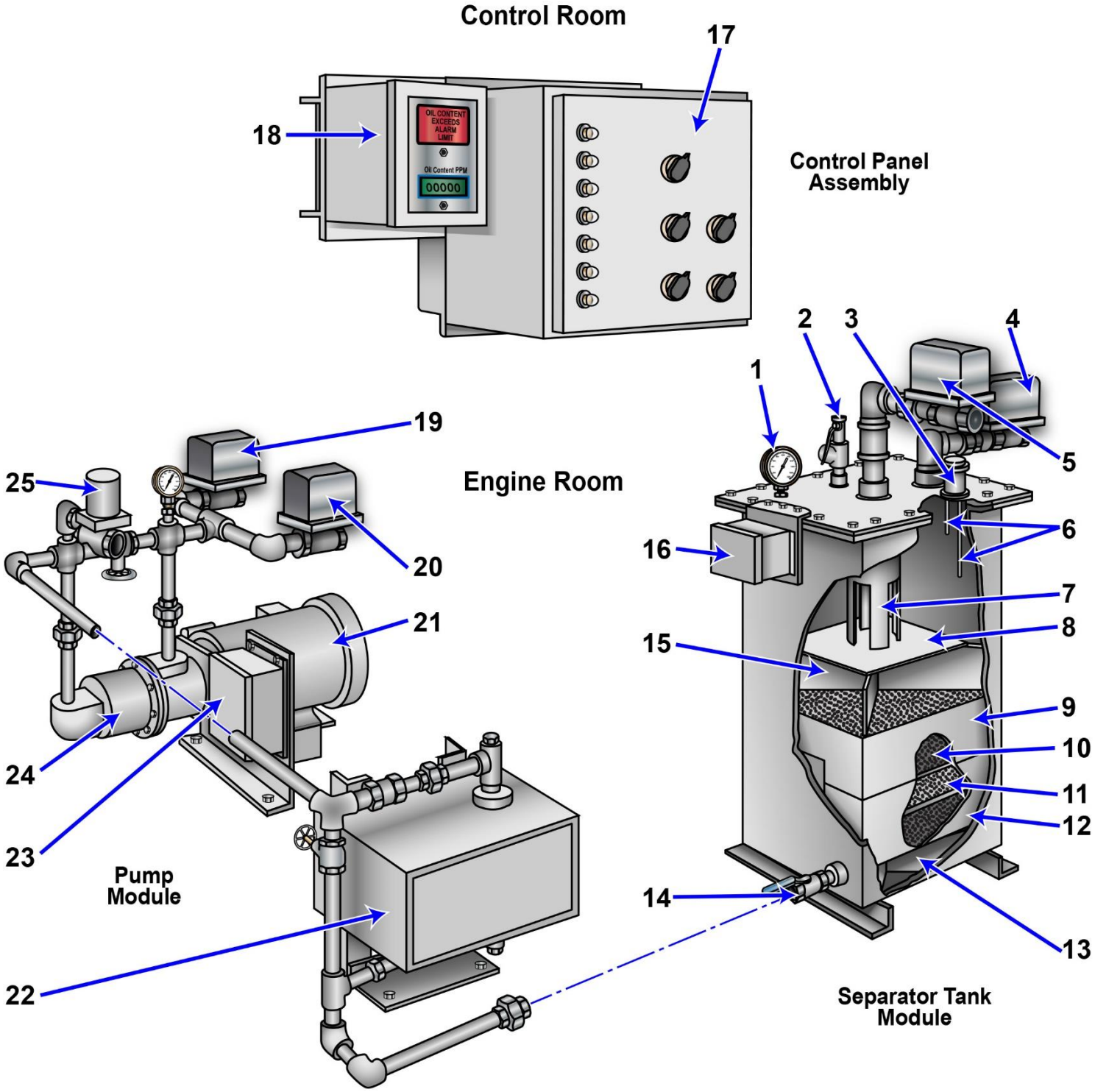
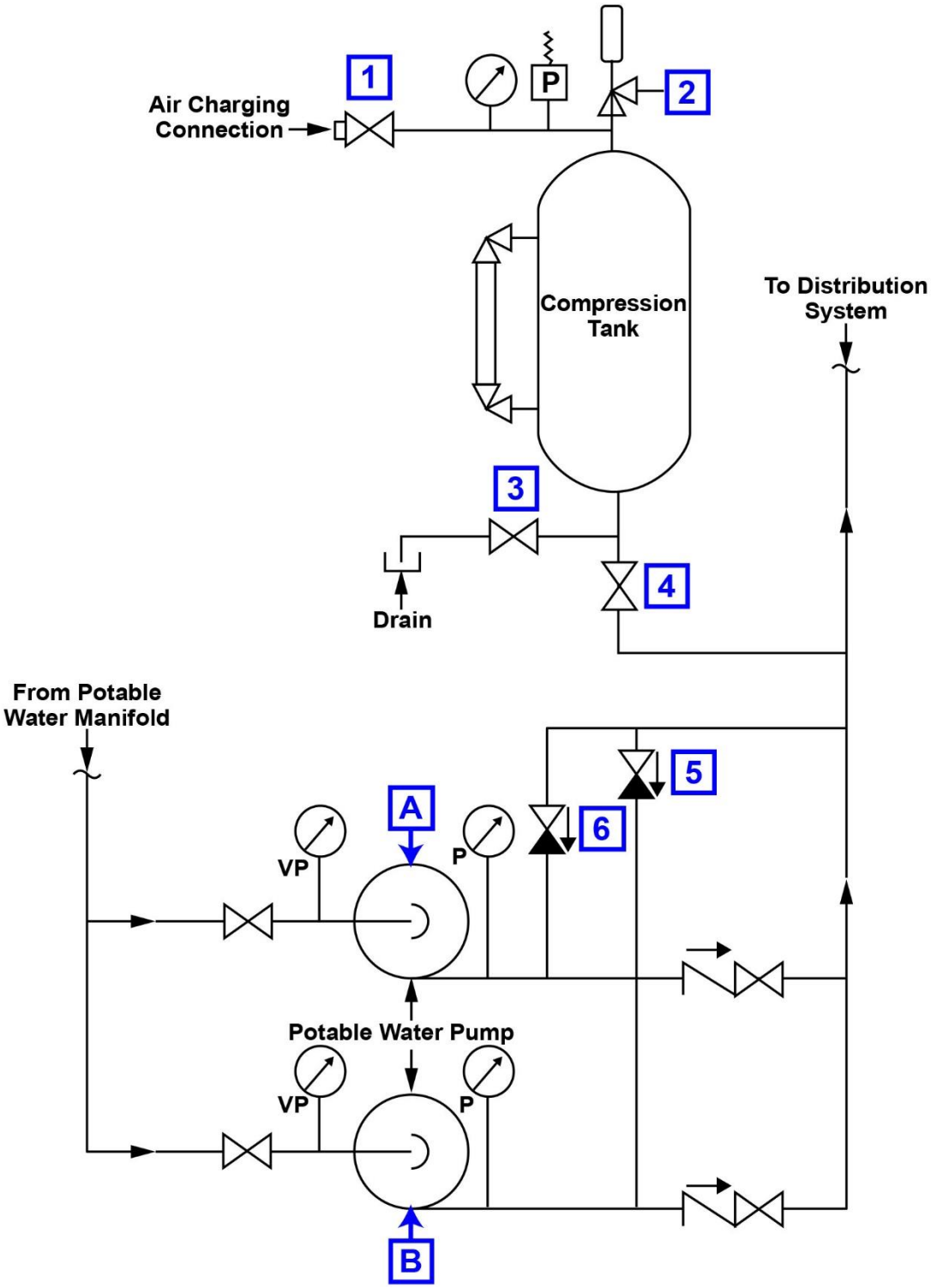
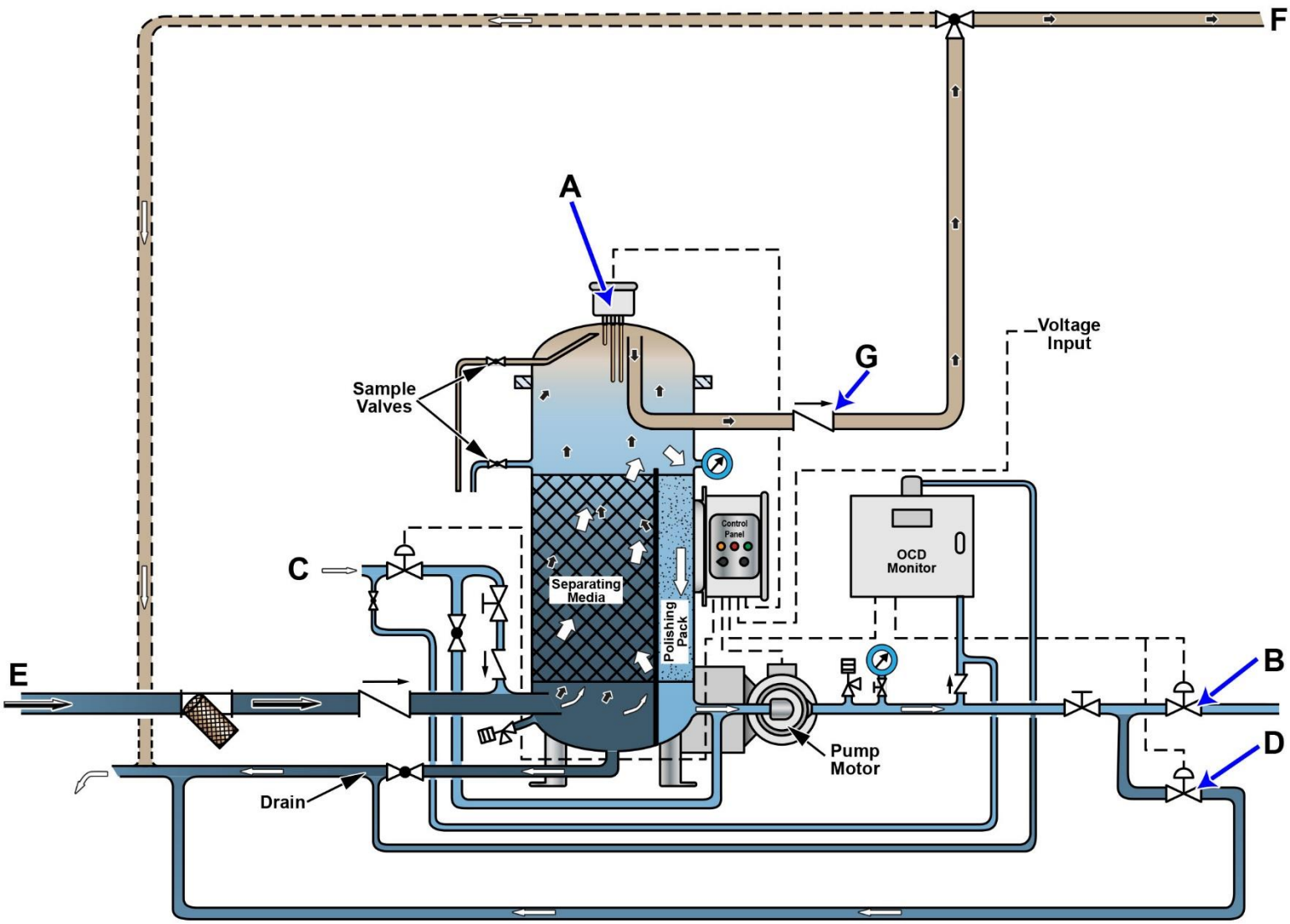


Adapted for testing purposes only from Operator, Unit and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Oil Water Separator TM 55-1925-285-13 & P

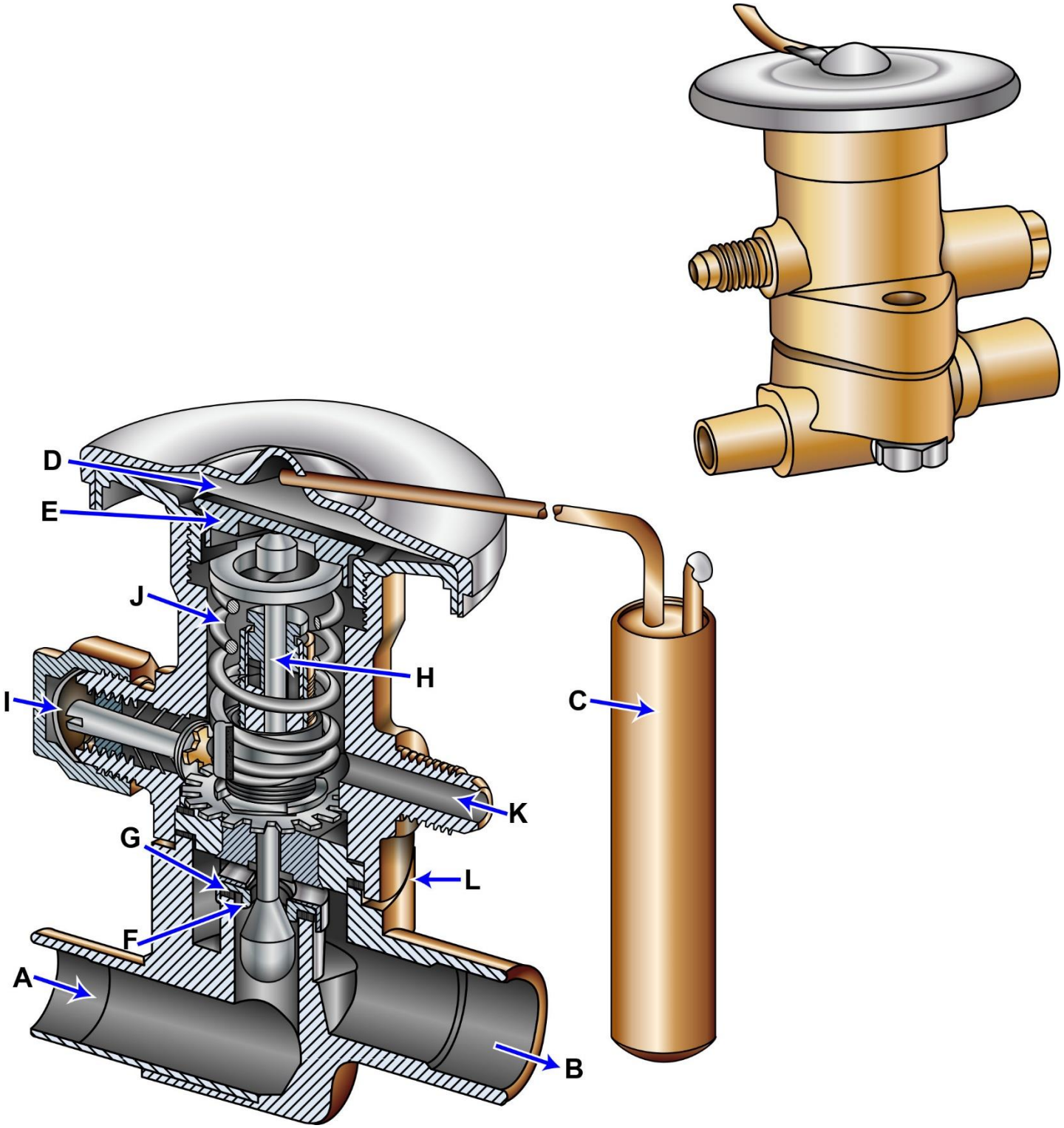
GS-0173



GS-0175



RA-0007



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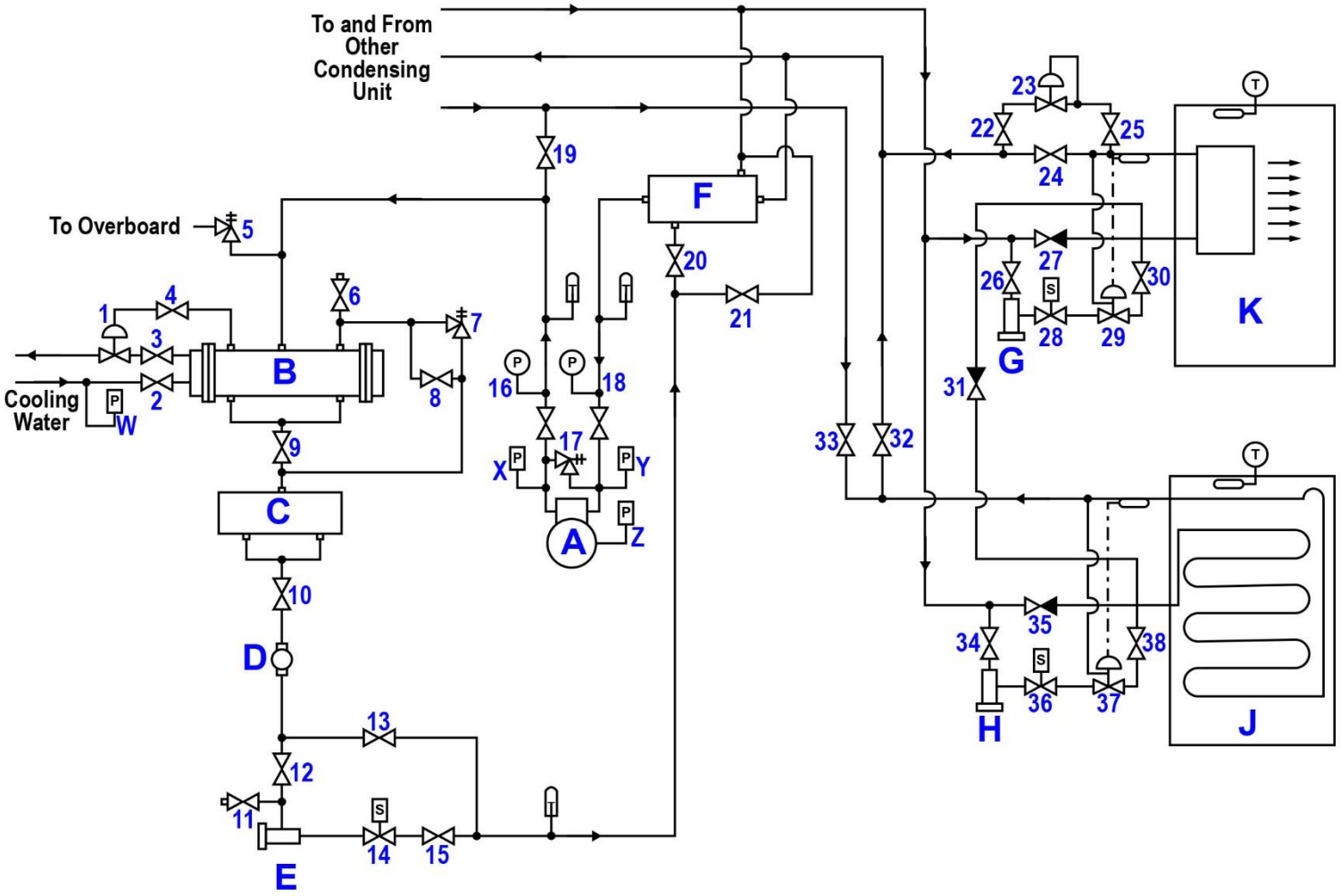

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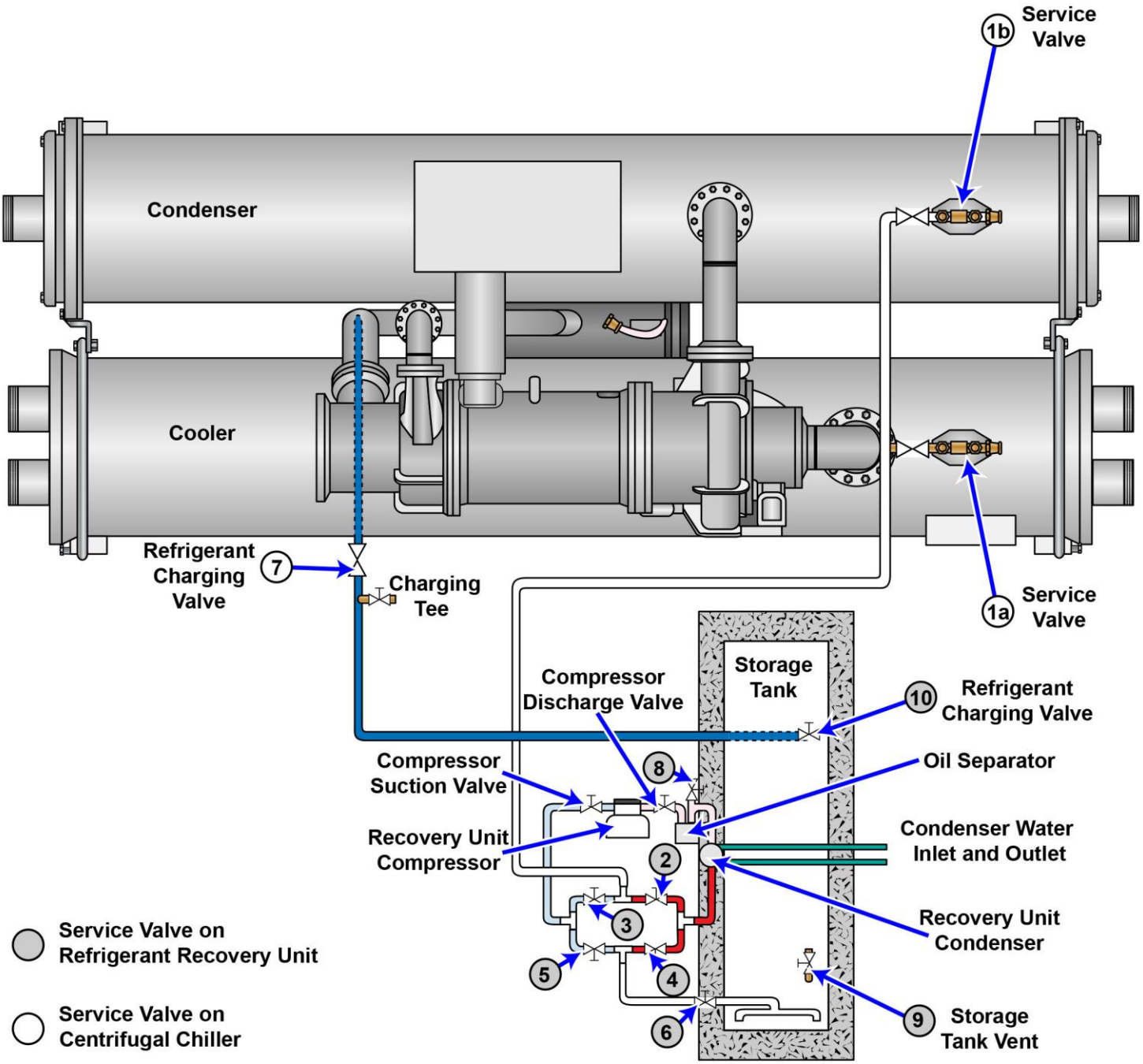
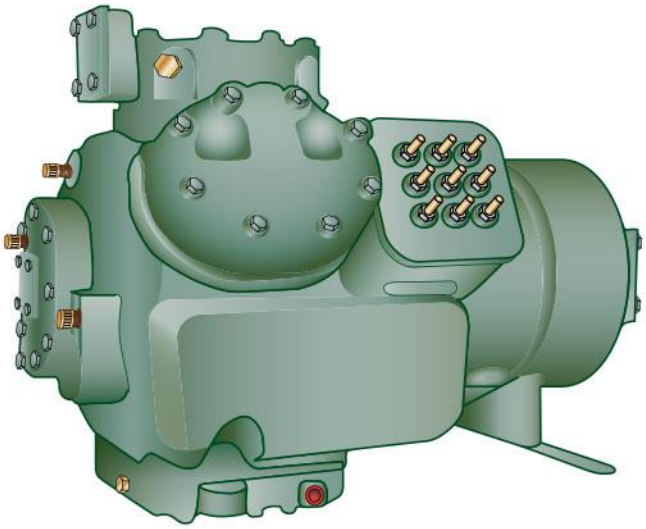


RA-0041

A



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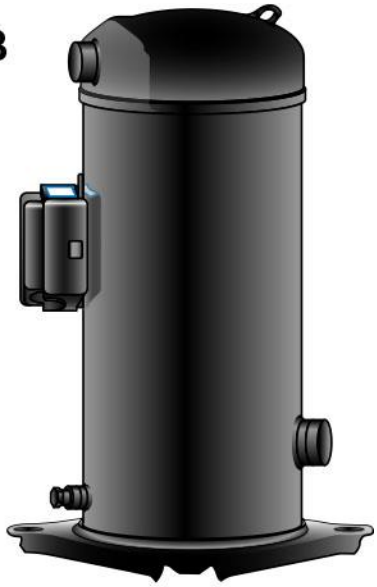

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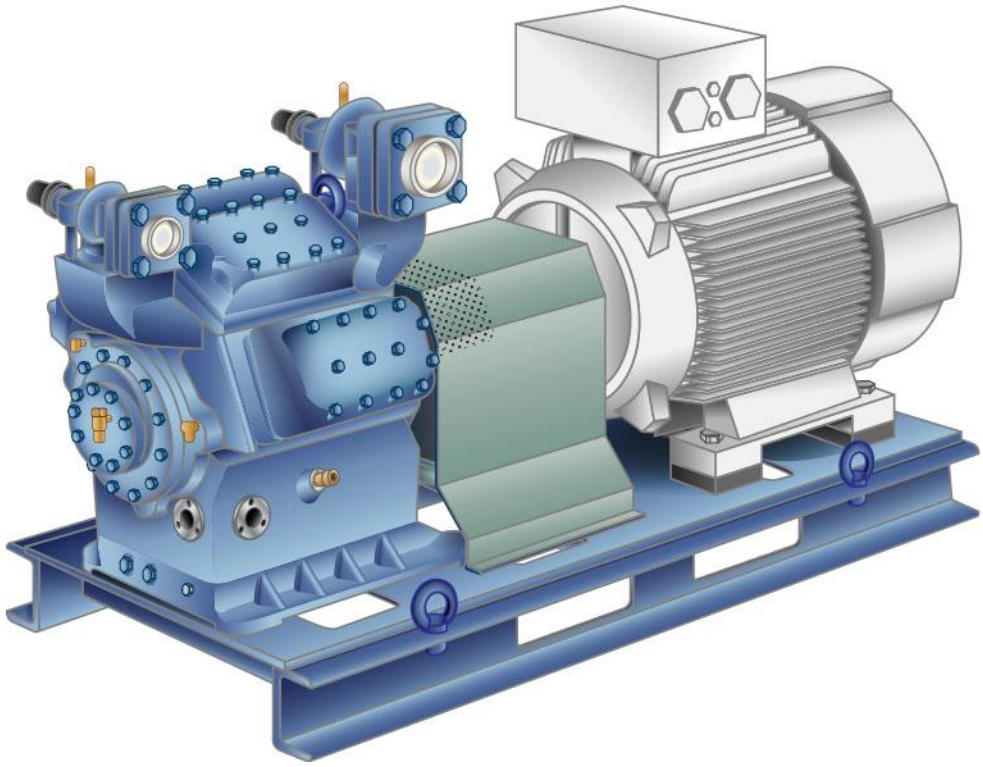

RA-0059