U.S.C.G. Merchant Marine Exam

QMED

Q801 Junior Engineer, Part II

(Sample Examination)

U.S.C.G. Merchant Marine Exam
QMED
Q801 Junior Engineer, Part II
Illustrations: 6

Choose the best answer to the following Multiple Choice Questions.

1. Why should battery rooms be well ventilated during the charging process?

- (A) highly poisonous gas is produced
- (B) highly combustible oxygen gas is produced
- (C) highly explosive hydrogen gas is produced
- (D) corrosive gases are produced

If choice C is selected set score to 1.

2. Inhalation of high concentrations of chlorofluorocarbon refrigerants (CFCs) may have which of the following effects?

- (A) loss of concentration
- (B) drowsiness
- (C) cardiac arrhythmias
- (D) all of the above

If choice D is selected set score to 1.

3. Dry chemical extinguishing agents extinguish a fire by _____.

- (A) breaking up the molecular chain reaction
- (B) cooling the fuel below ignition temperature
- (C) removing the fuel by absorbing the heated vapors
- (D) smothering and removing the oxygen from the fuel

If choice A is selected set score to 1.

4. Before charging a refrigeration unit, unless quick disconnect fittings are used, the refrigerant charging hoses should be prepared in what way?

- (A) they should be flushed with clean refrigerant oil
- (B) they should be cleaned with carbon tetrachloride
- (C) they should be purged with refrigerant
- (D) they should be warmed in an oven

If choice C is selected set score to 1.

5. In a refrigeration system, the push-pull technique can be used for the recovery of the refrigerant in what state?

- (A) liquid only
- (B) vapor only
- (C) both liquid and vapor
- (D) should never be used with low-pressure systems

If choice C is selected set score to 1.

6. The crosshatch design on the end of piece "3" in the illustration shown indicates that _____. Illustration GS-0020

- (A) the piece is made of mild carbon steel
- (B) the piece is screwed into piece 2
- (C) piece 3 is knurled in that area
- (D) piece 3 is made of stainless steel

If choice C is selected set score to 1.

7. 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

If choice B is selected set score to 1.

8. What is the functional name of an electrical device which prevents simultaneous energization of loads thereby preventing damage or injury?

- (A) electrical interlock device
- (B) monitoring device
- (C) modulating device
- (D) mechanical limit device

If choice A is selected set score to 1.

9. Which of the following statements is correct for the illustrated circuit in figure "B"? Illustration EL-0020

- (A) "R1", "R2", and "R3" are connected in parallel.
- (B) The total resistance equals 1/R1 + 1/R2 + 1/R3.
- (C) The voltages measured across "R1", "R2", and "R3" are equal.
- (D) "R1", "R2", and "R3" are connected in series.

If choice D is selected set score to 1.

10. The portion of a hydraulic hose that determines its overall strength is the _____.

- (A) inner tube
- (B) outer cover
- (C) outer armor
- (D) braided inner layer(s)

If choice D is selected set score to 1.

11. Capacity control of a centrifugal refrigeration compressor can be accomplished by what means?

- (A) varying the speed of the compressor
- (B) varying the position of the suction inlet damper vanes
- (C) varying the position of the hot gas bypass valve
- (D) all of the above

If choice D is selected set score to 1.

12. A tank has been sealed and unventilated for a long period of time. Which of the following statements is true?

- (A) The tank is especially dangerous to enter.
- (B) Carbon monoxide is present.
- (C) Water vapor present when the tank was sealed has oxidized.
- (D) The tank is safe to enter.

If choice A is selected set score to 1.

13. Water hammer in a steam heating system can be caused by _____.

- (A) filling the auxiliary boiler with cold water
- (B) steam admitted to a cold pipe
- (C) filling the auxiliary boiler with hot water
- (D) draining a soot blower line before cracking the steam supply valve

If choice B is selected set score to 1.

14. What should be done when correcting specific gravity readings of a lead-acid battery for existing temperature conditions?

- (A) add 4 correction points for each 10°F the battery temperature is above 80°F
- (B) subtract 4 correction points for each 10°F the battery temperature is above 80°F
- (C) subtract 10 correction points for each 4°F the battery temperature is above 80°F
- (D) add 10 correction points for each 4°F the battery temperature is above 80°F

If choice A is selected set score to 1.

15. When re-entering an engine room that has been flooded with CO_2, the investigating team should initially _____.

- (A) attempt to operate propulsion machinery
- (B) enter from the lowest possible level
- (C) leave the access door partially open
- (D) enter from the highest level with breathing apparatus

If choice D is selected set score to 1.

16. What is the characteristic of the blood flow associated with venous bleeding?

- (A) Bright red blood flowing from the wound with a steady flow.
- (B) Bright red blood flowing from the wound in spurts.
- (C) Dark red blood flowing from the wound in spurts.
- (D) Dark red blood flowing from the wound with a steady flow.

If choice D is selected set score to 1.

17. When water is removed from lube oil passing through a centrifugal purifier, the water removed will _____.

- (A) force the diameter of the oil column within the bowl to be narrowed
- (B) be retained in the bowl
- (C) displace water from the heavy phase discharge port, but of an amount less than that removed from the oil
- (D) displace an equal amount of water from the bowl seal

If choice D is selected set score to 1.

18. What statement best represents the characteristics of an innage tape and bob for the purposes of taking a vented tank sounding?

- (A) The bob has a cupped end and sinks in the liquid when lowered by the tape.
- (B) The bob has a pointed end and sinks in the liquid when lowered by the tape.
- (C) The bob has a cupped end and floats on the surface of the liquid when lowered by the tape.
- (D) The bob has a pointed end and floats on the surface of the liquid when lowered by the tape.

If choice B is selected set score to 1.

19. At a minimum threshold, how many milliamps of current through the body produces a condition where most people would be unable to let go of the energized electrical conductor due to involuntary muscular contraction?

- (A) 3 to 7 mA
- (B) 10 to 16 mA
- (C) 30 mA
- (D) 75 mA for 5 sec.

If choice B is selected set score to 1.

20. Which fire extinguisher is most prone to freezing when stowed in low temperatures?

- (A) Foam
- (B) Carbon dioxide
- (C) Halon 1211
- (D) Dry chemical

If choice A is selected set score to 1.

21. In preparing the surface of a metal for application of primers and finish coats, which of the listed hand tools is appropriate for surfaces with significant pitting?

- (A) Chipping hammer
- (B) Sandpaper
- (C) Wire brush
- (D) Hand scraper

If choice C is selected set score to 1.

22. Which of the following statements represents the important factor that must be considered when replacing a faulty diode in a generators excitation field rectifier assembly?

- (A) Be certain that the replacement diode is installed with the same polarity as the one removed.
- (B) The replacement diode must be dipped in varnish prior to installation to protect against humidity.
- (C) Never alter the diode alignment to cause a change in the neutral plane.
- (D) Replacement of a diode also requires balancing of the rotor with a one-piece rotor lamination to be shrunk fit and keyed to the shaft.

If choice A is selected set score to 1.

23. R-134a is often the replacement for which older type of refrigerant?

- (A) R-11
- (B) R-12
- (C) R-22
- (D) R-123

If choice B is selected set score to 1.

24. While wearing a self-contained breathing apparatus, the user must be aware of the bulkiness of the unit in order to avoid confined spaces. Of what other limitations should the user be aware?

- (A) The weight of the unit changes the user's center of gravity.
- (B) The attached lifeline limits the user's mobility.
- (C) The lens of the face piece reduces the user's peripheral vision.
- (D) All of the above.

If choice D is selected set score to 1.

25. If a lifeboat winch allows a lifeboat to descend to the water at an excessive speed, you should _____.

- (A) adjust the centrifugal brake mechanism
- (B) engage the motor friction clutch bands
- (C) adjust the davit mounted limit switches
- (D) remove unnecessary weight from the boat

If choice A is selected set score to 1.

26. What functionality do the "MS 1" contacts of the master switch shown in the illustration provide? Illustration EL-0102

- (A) low voltage protection
- (B) high power factor correction
- (C) overload protection
- (D) low voltage release

If choice A is selected set score to 1.

27. The most effective first aid treatment for chemical burns is to immediately _____.

- (A) apply an ice pack to the burned area
- (B) wrap the burn with sterile dressing
- (C) flood the affected area with water
- (D) apply ointment to burned area

If choice C is selected set score to 1.

28. In what application is a remote valve operator most likely to be located outside the machinery space when the valve itself is located within the machinery space?

- (A) A valve located in a compressed air line.
- (B) A valve located in a potable water transfer line.
- (C) A valve located in a sea water cooling line.
- (D) A valve located in a fuel oil transfer line.

If choice D is selected set score to 1.

29. A pipe coupling is a fitting having _____.

- (A) outside threads on both ends
- (B) inside threads on both ends
- (C) a left-hand twist
- (D) outside threads on one end and inside threads on one end

If choice B is selected set score to 1.

30. Small oil spills on deck can be prevented from contaminating any waters by _____.

- (A) regularly emptying all drip pans
- (B) plugging all scuppers and drains
- (C) placing floating booms around the ship
- (D) thoroughly draining all bunkering hoses

If choice B is selected set score to 1.

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

If choice D is selected set score to 1.

32. When opening or closing compressor service and line isolation valves on a typical refrigeration system that is fitted with packed valves, what must you do?

- (A) you must first remove the stem seal cap
- (B) you should replace the gasket each time the valve position is changed
- (C) you should never loosen or tighten the packing gland
- (D) you should turn valves slowly to avoid thermal stresses due to low temperatures

If choice A is selected set score to 1.

33. When required to work in an area where explosive gases may accumulate, you should use hand tools which are _____.

- (A) non-ferrous
- (B) high carbon steel
- (C) fixed with a ferrous cover
- (D) approved by the Coast Guard

If choice A is selected set score to 1.

34. When welding mild steel with a shielded metal-arc electrode, and getting only shallow penetration, you should _____.

- (A) increase the amperage
- (B) use a lower current
- (C) use larger electrodes
- (D) speed up your electrode travel

If choice A is selected set score to 1.

35. Which of the following represents the accepted method of cleaning dust and foreign particles from electrical equipment while limiting damage to electric components?

- (A) Using a vacuum cleaner to remove debris from the components.
- (B) Carefully using a soft copper bristle brush.
- (C) Blowing a high velocity stream of compressed air rapidly across the components.
- (D) Using carbon tetrachloride as a cleaning solvent to clean the components.

If choice A is selected set score to 1.

36. An oxygen indicator will detect _____.

- (A) the presence of harmful amounts of carbon monoxide
- (B) concentrations of explosive gas
- (C) an oxygen deficiency in a space
- (D) all of the above

If choice C is selected set score to 1.

37. Permanent centrifugal pump shaft damage due to erosion, corrosion, and wear at the stuffing box is usually prevented by _____.

- (A) wearing rings
- (B) internally flooded lantern rings
- (C) renewable sleeves
- (D) a hardened sprayed metal coating

If choice C is selected set score to 1.

38. When an aluminum plate is bolted to a steel plate, what is required at the bolted joint to minimize bimetallic corrosion?

- (A) The plates should be electrically insulated from one another by use of non-conductive gaskets and non-conductive ferrule sleeves with the bolts.
- (B) The plates should be bonded together electrically by joining the plates by a bonding strap in addition to bolting together.
- (C) Steel and aluminum are so close together on the Noble series that no particular provision need be made for bolting steel and aluminum plates together.
- (D) The plates should be bolted together in such a way as to ensure good electrical contact between the plates.

If choice A is selected set score to 1.

39. Which pair of the illustrated service gauge manifold sets would require switching hoses when transitioning from a dehydration evacuation to refrigerant charging? Illustration GS-RA-30

- (A) A and B
- (B) B and D
- (C) C and D
- (D) D and A

If choice B is selected set score to 1.

40. The control of exhaust temperature on a solid waste/sludge incinerator is critical. How is this temperature normally controlled?

- (A) The exhaust temperature is controlled by regulating the admission of combustion air into the combustion chamber.
- (B) The exhaust temperature is controlled by regulating the admission of auxiliary fuel to the burner.
- (C) The exhaust temperature is controlled by regulating the exhaust gas flow.
- (D) The exhaust temperature is controlled by regulating the admission of relatively cool ambient air into the exhaust stream.

If choice D is selected set score to 1.

41. In performing routine maintenance of a ship's service alternator, what should be included?

- (A) lubricating exciter slip rings
- (B) megger testing of all rectifying diodes
- (C) periodic cleaning of the air filters or screens
- (D) changing the pedestal bearing insulation yearly

If choice C is selected set score to 1.

42. When installing DANGER tags when performing a tag-out and lock-out procedure in preparation for accomplishing maintenance, what is the color of these tags?

- (A) Orange
- (B) Red
- (C) Yellow
- (D) Green

If choice B is selected set score to 1.

43. Which characteristic of fuel oil is the most significant when determining the temperature to which the fuel oil must be heated for proper atomization?

- (A) Flash point
- (B) Viscosity
- (C) Pour point
- (D) Specific gravity

If choice B is selected set score to 1.

44. A metal scribe commonly found on a combination square measuring tool should only be used to _____.

- (A) clean file teeth
- (B) punch gasket holes
- (C) remove packing
- (D) mark on metal

If choice D is selected set score to 1.

45. In the event of a fire, the doors to a stair tower must be closed to prevent the spread of fire by _____.

- (A) conduction
- (B) radiation
- (C) ventilation
- (D) convection

If choice D is selected set score to 1.

46. Which of the following statements represents the FIRST step in seating new brushes on slip rings?

- (A) Press the brushes against the slip ring with a wood block.
- (B) Apply seating compound under the brushes and run at no load for 2 hours.
- (C) Increase brush pressure and run at no load for 3 to 4 hours.
- (D) Lay sandpaper between the brush and the slip ring and slide the sandpaper back and forth under the brush.

If choice D is selected set score to 1.

47. Energy losses occurring in a hydraulic system are ultimately absorbed by the _____.

- (A) reservoir expansion chamber
- (B) hydraulic piping flexibility
- (C) atmosphere as heat
- (D) fluid as friction

If choice C is selected set score to 1.

48. The "tare weight" of a refrigerant storage cylinder refers to what weight?

- (A) the total weight of a fully charged cylinder
- (B) the weight of an empty cylinder
- (C) the weight of a cylinder AND its current contents
- (D) the maximum weight of the refrigerant allowed

If choice B is selected set score to 1.

49. When the cotton cover of a fire hose becomes oily or greasy, it should be washed with a solution of mild soapy fresh water and _____.

- (A) paint thinner
- (B) a soft-bristled brush
- (C) a wire brush
- (D) cornstarch

If choice B is selected set score to 1.

50. Which of the listed tools should be used to remove a tapered roller bearing from a shaft?

- (A) An acetylene torch and hammer
- (B) A tapered "come-a-long"
- (C) A steel drift pin and hammer
- (D) An arbor press

If choice D is selected set score to 1.

51. Which of the following methods will reduce the possibility of producing an electrical spark?

- (A) Placing an insulating flange or a section of non-conducting hose in the hose setup.
- (B) Using a cargo hose with a built in electrical bonding wire.
- (C) Connecting a bonding wire between the shore side piping and the vessel.
- (D) All of the above.

If choice D is selected set score to 1.

52. An example of an antifriction bearing is a _____.

- (A) line shaft or spring bearing
- (B) Kingsbury thrust bearing
- (C) rubber cutlass strut bearing
- (D) ball bearing

If choice D is selected set score to 1.

53. The hydraulic pump which would be mounted on the unit shown in the illustration, may begin to cavitate if _____. Illustration GS-0118

- (A) "A" is allowed to remain open
- (B) "B" is over-tightened
- (C) "H" were to be removed and the system operated for thirty minutes without it being replaced
- (D) "D" is not kept clean

If choice D is selected set score to 1.

54. In a refrigeration system that is not protected by a water failure switch, if the cooling water to the condenser fails, what will be the result for protective purposes?

- (A) the king valve will open
- (B) the box temperature solenoid valve will close initiating a pump down
- (C) the compressor will shut down by the action of the high-pressure cut-out switch
- (D) the expansion valve will close due to high superheat

If choice C is selected set score to 1.

55. Which of the formulas listed is correct for determining power?

- (A) P = (E)(E)/R
- (B) P = E/R
- (C) P = (I)(R)(R)
- (D) P = (I)(I)/R

If choice A is selected set score to 1.

56. The nominal open-circuit voltage of one cell of a fully charged lead-acid battery is approximately how many volts?

- (A) 1.5 volts
- (B) 2 volts
- (C) 6 volts
- (D) 12 volts

If choice B is selected set score to 1.

57. In comparing a semiconductor diode to a vacuum tube diode, what statement is true?

- (A) The semiconductor diode has longer life, no warm-up time, and is more delicate than the vacuum tube diode.
- (B) The semiconductor diode has shorter life, no warm-up time, and is less delicate than the vacuum tube diode.
- (C) The semiconductor diode has longer life, longer warm-up time and is less delicate than the vacuum tube diode.
- (D) The semiconductor diode has longer life, no warm-up time, and is less delicate than the vacuum tube diode.

If choice D is selected set score to 1.

58. Before electrical work can be safely undertaken, the equipment must be de-energized, locked and tagged out, and verification must be made that the circuit is actually dead. What testing device is most certain to reliably verify that a circuit is actually dead?

- (A) a non-contact voltage tester
- (B) an auto ranging digital multimeter
- (C) a solenoid type voltage tester
- (D) a non-auto ranging digital multimeter

If choice B is selected set score to 1.

59. Under what circumstances can equipment be operated when tagged with a DANGER tag?

- (A) Whenever you feel that it is safe to do so.
- (B) Whenever permission is granted by your supervisor.
- (C) Whenever there is a break in the actual maintenance activity.
- (D) Under NO circumstances should the equipment be operated when tagged.

If choice D is selected set score to 1.

60. With regard to the number of passes through the tubes of shell-and-tube heat exchangers, what statement is true?

- (A) In single-pass and two-pass heat exchangers, the inlet and outlet tube-side fluid connections are at opposite ends.
- (B) In single-pass and two-pass heat exchangers, the inlet and outlet tube-side fluid connections are at the same end.
- (C) In two-pass and four-pass heat exchangers, the inlet and outlet tube-side fluid connections are at opposite ends.
- (D) In two-pass and four-pass heat exchangers, the inlet and outlet tube-side fluid connections are at the same end.

If choice D is selected set score to 1.

61. Energy imparted to the hydraulic fluid in an operating hydraulic system is stored in the _____.

- (A) ram
- (B) actuator
- (C) reservoir
- (D) accumulator

If choice D is selected set score to 1.

62. Which of the following viscosity scales measures kinematic viscosity?

- (A) Saybolt Universal Seconds (SSU)
- (B) Furol Seconds
- (C) Centistokes (cSt)
- (D) Society of Automotive Engineers (SAE)

If choice C is selected set score to 1.

63. Which of the following statements is TRUE concerning life jackets?

- (A) Buoyant vests may be substituted for life jackets.
- (B) Life jackets are designed to turn an unconscious person's face clear of the water.
- (C) Life jackets must always be worn with the same side facing outwards to float properly.
- (D) Lightly stained or faded life jackets will fail in the water and should not be used.

If choice B is selected set score to 1.

64. What statement is true concerning the effect of elevating the temperature of the oily-water mixture associated with an oily-water separator?

- (A) Heating the oily-water mixture decreases the viscosity of the oil and decreases the specific gravity differential between the oil and water.
- (B) Heating the oily-water mixture increases the viscosity of the oil and decreases the specific gravity differential between the oil and water.
- (C) Heating the oily-water mixture decreases the viscosity of the oil and increases the specific gravity differential between the oil and water.
- (D) Heating the oily-water mixture increases the viscosity of the oil and increases the specific gravity differential between the oil and water.

If choice C is selected set score to 1.

65. Protective equipment to be used while carrying out oxyacetylene welding should always include _____.

- (A) goggles
- (B) ear plugs
- (C) steel toe safety shoes
- (D) non-sparking tools

If choice A is selected set score to 1.

66. If for any reason it is necessary to abandon ship while far at sea, it is important for the crew members to _____.

- (A) separate from each other as this will increase the chances of being rescued
- (B) get away from the area because sharks will be attracted to the vessel
- (C) immediately head for the nearest land
- (D) remain together in the area because rescuers will start searching at the vessel's last known position

If choice D is selected set score to 1.

67. The electrolyte used in a nickel-cadmium battery is distilled water and what other substance?

- (A) lead sulfate
- (B) potassium hydroxide
- (C) zinc oxide
- (D) diluted sulfuric acid

If choice B is selected set score to 1.

68. A typical common digital multimeter (DMM) can be used to measure what values?

- (A) current, frequency, and resistance
- (B) voltage, current, and reactance
- (C) current, frequency, and reactance
- (D) voltage, current, and resistance

If choice D is selected set score to 1.

69. 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) distilled water
- (D) mercuric sulfate

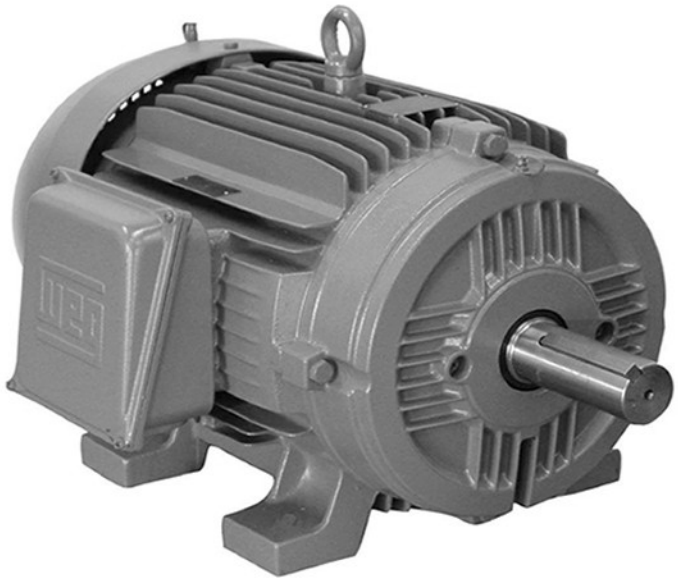
If choice A is selected set score to 1.

70. (1.1.1.1.1-1) Which of the illustrated motors has a totally enclosed, fan-cooled (TEFC) motor enclosure? Illustration EL-0001

- (A) A
- (B) B
- (C) C
- (D) D

If choice A is selected set score to 1.

EL-0001



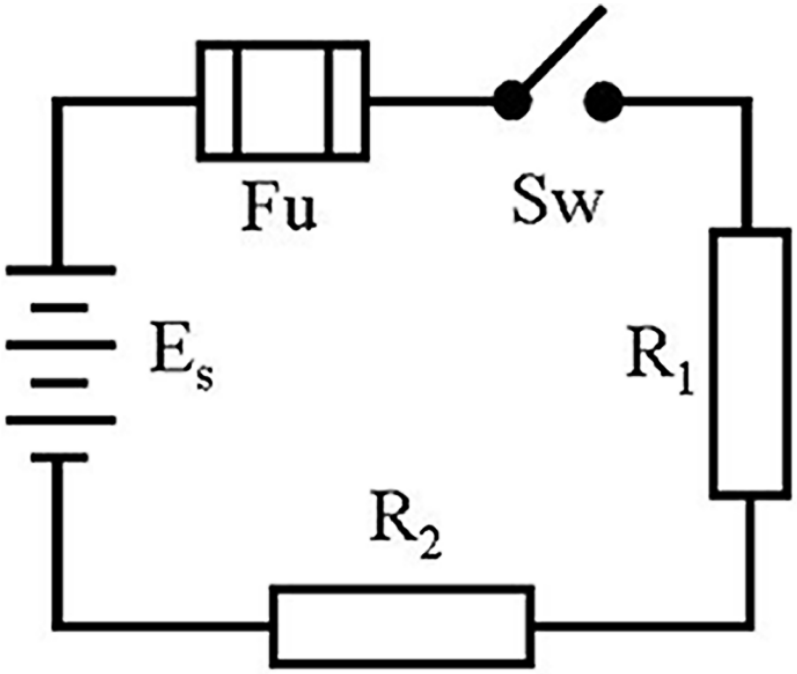
A

B

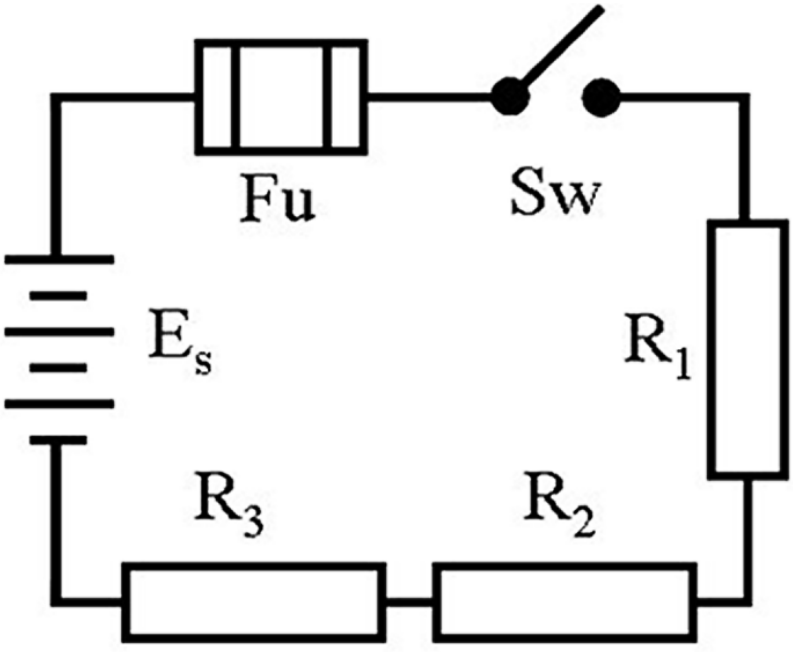
C

D

EL-0020

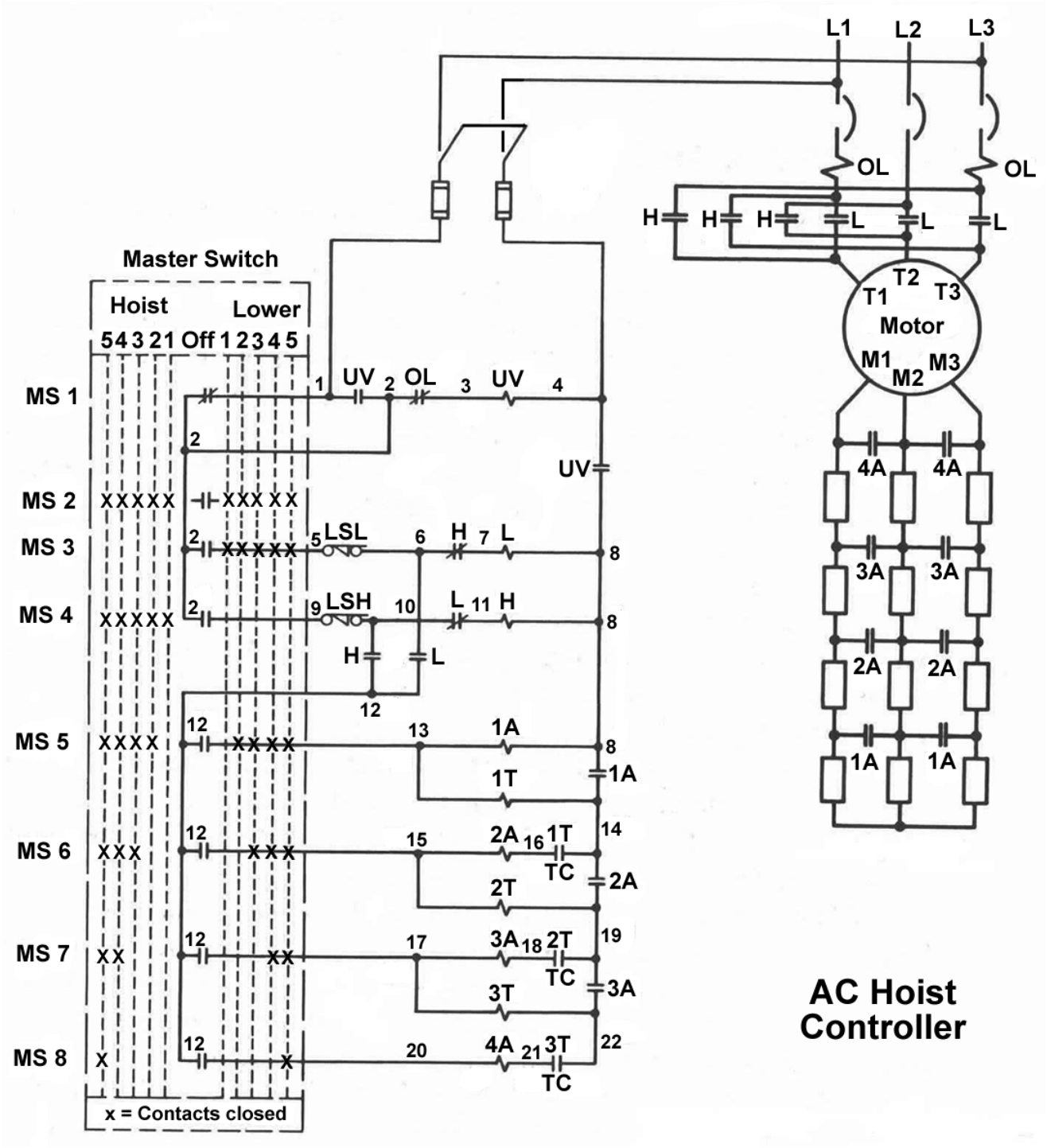


A

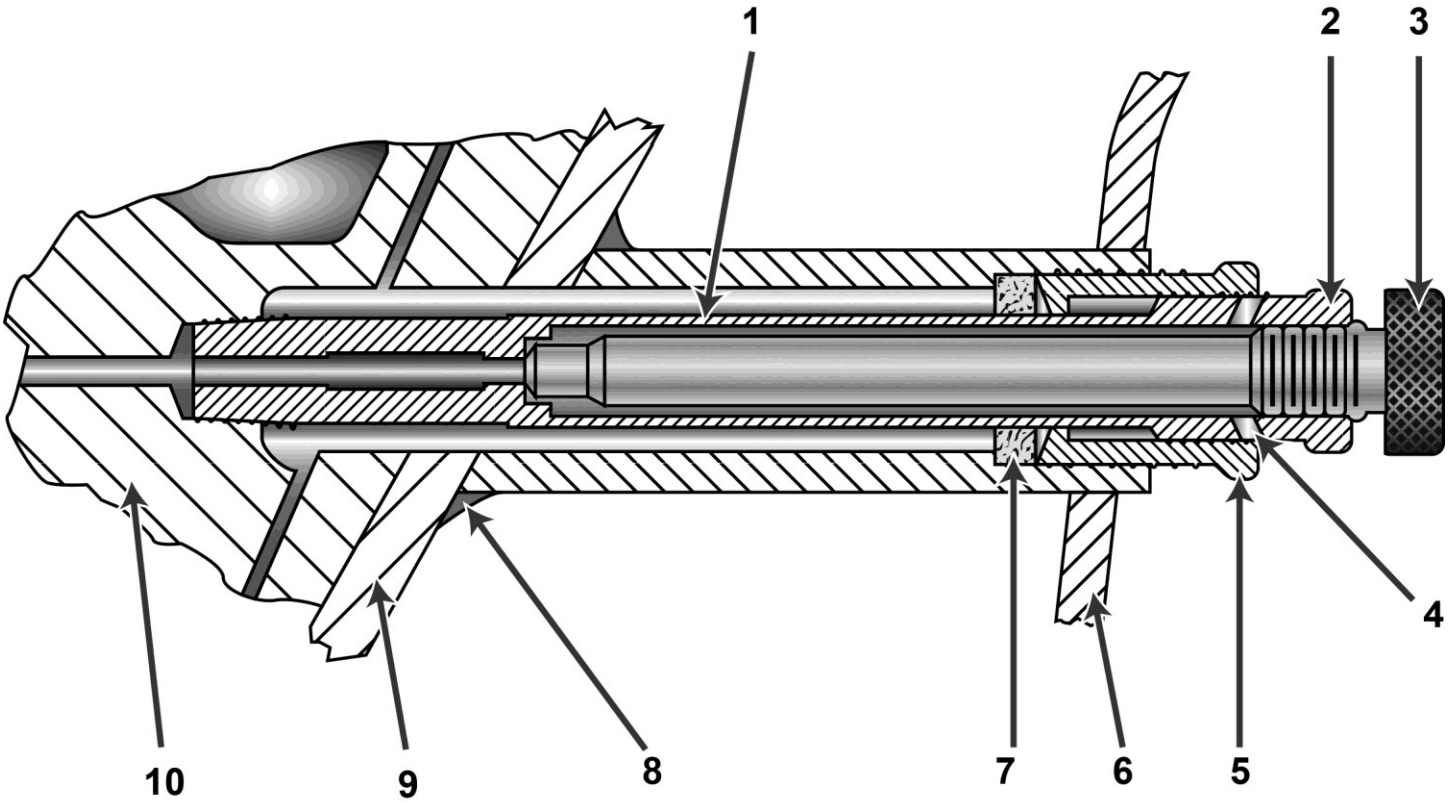


B

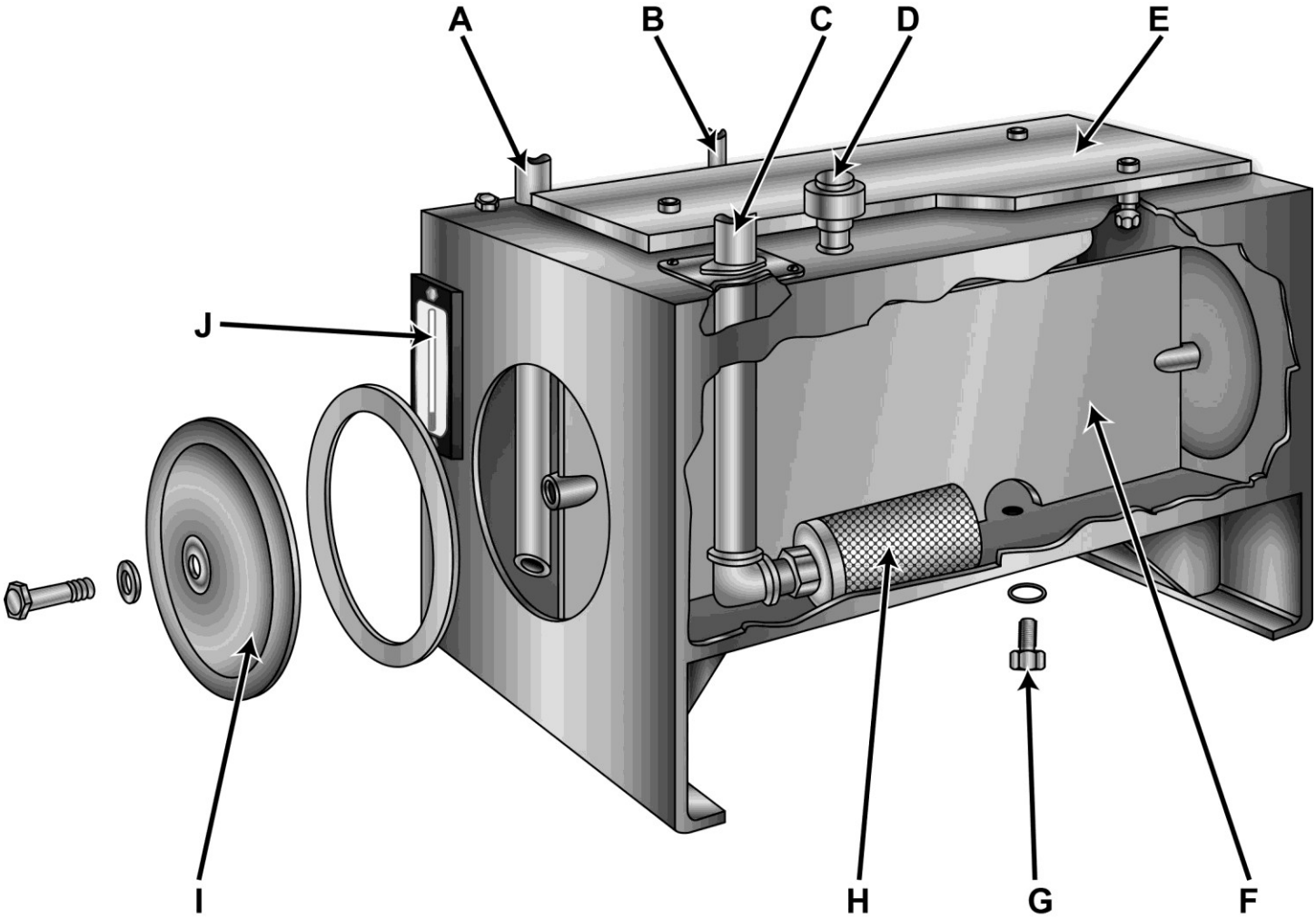
EL-0102



GS-0020



GS-0118



GS-RA-30