U.S.C.G. Merchant Marine Exam

QMED

Q802 Electrician

(Sample Examination)

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

1. Which of the following statements concerning a circuit with parallel connected resistors is correct?

   A. The total voltage equals the sum of the individual voltages across each resistance.
   B. The voltage drop across each resistor is the same.
   C. The total current flow equals the reciprocal of the sum of the individual currents.
   D. The total resistance equals the sum of the individual resistances.

   Correct answer: B

2. In the system shown in the illustration, the engine room station is unable to signal any other station, nor is any other station able to signal the engine room station. The engine room station can, however, ring itself by proper positioning of its selector switch. What is the most probable cause of this problem? Illustration EL-0093

   A. There is an open between terminal "C" of the problem station and the common wire of the multi-conductor cable to the other stations.
   B. The selector switch is grounded at the problem station diverting current from the other stations' ringing devices.
   C. The switch at component "A" of the problem station is stuck open.
   D. The coil of component "C" of the problem station is open-circuited.

   Correct answer: A

3. In a basic AC induction motor, by what means is current induced in the rotor?

   A. magnetically by the rotating stator field
   B. an armature and brushes
   C. a bridge rectifier
   D. external variable resistors

   Correct answer: A

4. In general, how are nickel-cadmium storage batteries superior to lead-acid batteries?

   A. they need fewer cells in series and use less mounting space
   B. they can remain idle and keep a full charge for a long time
   C. they put out higher voltages and require no maintenance
   D. they are less costly to replace

   Correct answer: B

5. An increase in which of the listed conditions will increase the speed of a synchronous electric motor?

   A. Frequency
   B. Inductance
   C. Armature current
   D. Voltage

   Correct answer: A

6. A digital multimeter is set up as shown in the illustration to evaluate the single-circuit stator windings of a squirrel cage induction three-phase motor. The following readings are taken: From T1 to T2 reads "OL" ohms. From T2 to T3 reads "OL" ohms. From T3 to T1 as shown reads "1.6" ohms. What condition is indicated? Illustration EL-0219

   A. Phase A (associated with T1) and Phase C (associated with T3) are open-circuited. Phase B (associated with T2) is undamaged.
   B. Phase A (associated with T1) and Phase C (associated with T3) are undamaged. Phase B (associated with T2) is short-circuited.
   C. Phase A (associated with T1) and Phase C (associated with T3) are undamaged. Phase B (associated with T2) is open-circuited.
   D. Phase A (associated with T1) and Phase C (associated with T3) are short-circuited. Phase B (associated with T2) is undamaged.

   Correct answer: C

7. A coolant is usually used when cutting metal in a power hacksaw to prevent the _____.

   A. blade from overheating
   B. blade from bending
   C. cut from clogging
   D. blade from catching on the work piece

   Correct answer: A

8. What is the preferred method of protecting an electrical maintenance worker from electrical hazards while performing work on an electrical circuit?

   A. performing a lock-out/tag-out procedure
   B. shutting down the necessary equipment
   C. using the appropriate personal protective equipment
   D. posting of safety warning signs

   Correct answer: A

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

   A. ball bearing
   B. Kingsbury thrust bearing
   C. rubber cutlass strut bearing
   D. line shaft or spring bearing

   Correct answer: A

10. Which of the listed devices would be installed in the air compressor discharge line between the compressor and receiver of a control air system?

   A. Moisture separator
   B. P-I converter
   C. Lubricator
   D. Vacuum breaker

   Correct answer: A

11. If the centrifugal switch or relay used for cutting out the starting winding of a split-phase induction motor fails to open once the motor is in operation, what will be the result?

    A. the motor will overspeed
    B. the motor torque will be above normal at rated speed
    C. the motor will immediately stall under load
    D. the starting winding will burn out

    Correct answer: D

12. Fusible plugs are installed in fire-tube boilers to _____.

    A. provide a means of draining the boiler
    B. warn the engineer of low water level
    C. cool the crown sheet at high firing rates
    D. open the burners' electrical firing circuits

    Correct answer: B

13. What is the primary reason that idle burners on a boiler be regularly checked to ensure that they do not drip?

    A. To prevent boiler flarebacks
    B. To prevent excessive fuel consumption
    C. To prevent slag formation on the furnace floor
    D. To prevent excessive soot buildup on boiler tubes

    Correct answer: A

14. As shown in the illustration, which brush holder would be appropriate to use in a bidirectional motor? Illustration EL-0029

    A. trailing mount only
    B. radial mount
    C. both leading and trailing mount
    D. leading mount only

    Correct answer: B

15. When replacing fuses, what practice should be observed?

    A. to use insulated pliers or screwdriver
    B. the fuse clips are straight, tight, and in good contact
    C. to increase the fuse rating 10% to guard against 'nuisance blowing'
    D. to stand on a rubber mat and use rubber gloves

    Correct answer: B

16. In a simple DC circuit, the resistance is held constant while the applied voltage is halved. What will be the effect on the current flow as compared to the original current?

    A. double
    B. remain the same
    C. be divided by two
    D. be divided by four

    Correct answer: C

17. If rotor-to-stator air gap readings for an electrical generating machine have changed significantly from the last reading, what should be checked?

    A. the generator bearings for wear
    B. the field coil bolts for the proper torque values
    C. insulation readings and machine cleanliness
    D. the prime mover thrust bearing for wear

    Correct answer: A

18. If the bearings of a piece of machinery are fed by a gravity feed lubricating oil system, what statement is true?

    A. The lube oil pump draws a suction on the lube oil gravity tank and discharges directly to the bearings. The return oil then gravity drains to the lube oil gravity tank.
    B. The lube oil pump draws a suction on the lube oil reservoir/sump and discharges directly to the bearings. The return oil then gravity drains to the lube oil reservoir/sump.
    C. The lube oil pump draws a suction on the lube oil reservoir/sump and discharges directly to the bearings. The return oil then gravity drains to the lube oil gravity tank which overflows to the lube oil reservoir/sump.
    D. The lube oil pump draws a suction on the lube oil reservoir/sump and discharges to the lube oil gravity tank. The oil then gravity feeds the bearings and the return oil drains to the lube oil reservoir/sump.

    Correct answer: D

19. What is the voltage across "R1" of figure "B" of the illustrated circuit with the switch closed if the applied voltage is 24 volts and resistance of R1 is 3 ohms, R2 is 4 ohms, and R3 is 5 ohms, respectively? Illustration EL-0020

    A. 2 volts
    B. 6 volts
    C. 8 volts
    D. 10 volts

    Correct answer: B

20. The bypass valve on a self-contained breathing apparatus (SCBA) bypasses _____.

    A. the regenerator in an emergency
    B. the regulator in an emergency
    C. oxygen to the atmosphere
    D. a breathing bag containing excessive pressure

    Correct answer: B

21. If you are given the job of adding hydraulic fluid to a mooring winch and are not certain as to the type of fluid to use, you should _____.

    A. add turbine oil because it is always a good substitute
    B. check the winch manufacturer's instruction book
    C. add fluid that is the same color as the fluid in the reservoir
    D. add any oil that has the same viscosity as the hydraulic fluid

    Correct answer: B

22. An undervoltage release mechanism (UVR) is fitted to all generator breakers and some main feeder circuit breakers for what primary reason?

    A. trip out the breaker if the generator overspeeds by 5%, but continues to run
    B. trip out the breaker when a severe voltage dip occurs
    C. trip out generators when there is reversal of power in the main circuit
    D. trip out generators in the event of severe arcing or sparking

    Correct answer: B

23. Which of the following extinguishing effects for dry chemical extinguishing agents is considered the most prevalent?

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

    Correct answer: A

24. A file coated with oil and stowed away will _____.

    A. cause the file to overheat
    B. cause the file to slide across the work and prevent fast, clean cutting
    C. cause dust and metal particles to collect in the teeth
    D. both B and C are correct

    Correct answer: D

25. Universal motors will operate on AC or DC current. In what application is this type of motor generally?

    A. large pump motors
    B. forced draft fans
    C. turbo-electric main motors
    D. portable tools

    Correct answer: D

26. In general, what type of starter would be used to connect a three-phase induction motor to full line voltage at the instant of start-up?

    A. VFD starters
    B. across-the-line starters
    C. autotransformer starters
    D. resistor starters

    Correct answer: B

27. Pressure in an operating hydraulic system is developed _____.

    A. by resistance to the fluid flow through the system
    B. solely by the charge applied by the accumulators
    C. by the thermal input to the system's fluid
    D. only by the pump as its primary function

    Correct answer: A

28. In a typical automatic fire alarm system, which of the listed actions will cause an indication of a fire to be given in the annunciator cabinet?

    A. The fire alarm test push button is operated
    B. A manual fire alarm box is activated
    C. A rise in temperature activating a heat detector
    D. All of the above

    Correct answer: D

29. Which type of flux should be used when soldering electrical wire connections for electronic components on printed circuit boards?

    A. Rosin flux
    B. Silver flux
    C. Acid flux
    D. Solid flux

    Correct answer: A

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

    A. zinc oxide
    B. potassium hydroxide
    C. lead sulfate
    D. diluted sulfuric acid

    Correct answer: B

31. If a magnetic controller contact fails to pick up when the operating coil is energized, what could be one possible cause?

    A. dirty contact faces
    B. the residual magnetism of the contact faces
    C. low spring pressure
    D. low applied voltage to the coil

    Correct answer: D

32. Antiseptics are used principally to _____.

    A. promote healing
    B. prevent infection
    C. increase blood circulation
    D. reduce inflammation

    Correct answer: B

33. Moisture damage, as a result of condensation occurring inside of the cargo winch master switches, can be reduced by the use of what installed equipment?

    A. installing a light bulb in the pedestal stand
    B. coating the switch box internals with epoxy sealer
    C. venting the switch box regularly
    D. using strip heaters inside the switch box

    Correct answer: D

34. What type of eye protection affords the best protection from severe exposure to airborne impact hazards?

    A. Side-shielded safety glasses
    B. Full-face shield and safety goggles
    C. Eyecup or cover-type safety goggles
    D. Full-face shield

    Correct answer: B

35. The individual 6 volt lead-acid batteries, when connected as shown in the illustration, as a battery bank would produce how many volts? Illustration EL-0070

    A. 6
    B. 12
    C. 18
    D. 24

    Correct answer: A

36. In cleaning up an oil spill, the use of straw or reclaimed paper fibers would be an example of which type of oil removal?

    A. Chemical agent removal
    B. Absorbent removal
    C. Mechanical removal
    D. None of the above

    Correct answer: B

37. Which of the following conditions would most likely lead to the failure of a resistor due to overheating?

    A. Resistor wattage rating one-half that required for the circuit
    B. Resistor wattage rating equal to that required for the circuit
    C. Resistor wattage rating four times higher than that required for the circuit
    D. Resistor wattage rating two times higher than that required for the circuit

    Correct answer: A

38. To operate a carbon dioxide extinguisher having the type of head shown in the illustration, you would _____. Illustration SF-0008

    A. open valve and pull pin
    B. pull pin, open valve, and pull up on release lever
    C. pull pin and open valve
    D. open valve, pull pin, and pull up on release lever

    Correct answer: C

39. In order to take a current reading with a "clamp-on" ammeter, what should be the status of the jaws of the instrument?

    A. must be clamped around all of the conductors of a cable
    B. must be fully closed so as to complete the magnetic circuit
    C. should remain open while conducting measurements
    D. must be held so as to not touch an adjacent conductor

    Correct answer: B

40. If a sea water-cooled shell-and-tube lubricating oil cooler has the sea water inlet and outlet connections on the opposite end waterboxes, in terms of the number of passes, what statement is true?

    A. The tube-side fluid flow pattern is two-pass
    B. The tube-side fluid flow pattern is single-pass
    C. The number of fluid passes cannot be determined
    D. The tube-side fluid flow pattern is four-pass

    Correct answer: C

41. What practice could potentially damage a multimeter?

    A. placing the test leads in series with the load of a circuit to measure current while in the voltmeter mode
    B. placing the test leads across a de-energized and isolated resistance to measure resistance while in the ammeter mode
    C. placing the test leads across a voltage source to measure voltage while in the resistance mode
    D. placing the test leads across a de-energized and isolated resistance to measure resistance while in the voltmeter mode

    Correct answer: C

42. Which of the following statements is correct regarding the fog applicators used in conjunction with the combination nozzle?

    A. In machinery spaces, the applicators should be 10 to 12 feet in length to ensure all portions of the bilge can be effectively reached.
    B. On container ships, an applicator termed a bayonet or piercing type utilizes a sharp tip for cutting and penetrating the metal skin of a container.
    C. All cargo and miscellaneous vessels must be equipped with high velocity fog applicators for use with the required combination nozzle at each station.
    D. On oil tankers, the applicators come furnished with foam nozzles.

    Correct answer: B

43. It is necessary to cool the bulkheads and decks surrounding a compartment where there is a fire in order to _____.

    A. cool the metal below its ignition temperature
    B. form a dense coating of smothering steam
    C. prevent oxygen from reaching the flames
    D. prevent the fire from spreading by the conduction of heat

    Correct answer: D

44. What is a useful instrument for checking 3-phase AC motor performance by measuring possible unbalanced currents?

    A. D'Arsonval iron-vane probe
    B. clamp-on ammeter
    C. vibrating-reed frequency meter
    D. hand or battery-operated megger

    Correct answer: B

45. A pump shaft that is bent or distorted should normally be _____.

    A. replaced with a satisfactory spare
    B. reconditioned by metalizing and machining
    C. repaired by a suitable welding process
    D. straightened by applying heat and torsion

    Correct answer: A

46. With all other factors considered equal (such as voltage, conducting path through the body and the duration of contact), contact with an energized electrical system conductor of which system type would produce the most damaging effect?

    A. DC systems
    B. 60 Hz AC systems
    C. 10 kHz AC systems
    D. All the above systems would be equally as damaging

    Correct answer: B

47. An electrical connection between the wiring of an electric motor and its metal frame is known as what?

    A. flux leakage
    B. impedance
    C. ground
    D. eddy current

    Correct answer: C

48. In electronic circuitry, what does the abbreviation "PCB" commonly represent?

    A. printed circuit board
    B. pulse coded binary
    C. personal computer bits
    D. poly-coated braid

    Correct answer: A

49. The FIRST requirement for logical troubleshooting of any system requires the troubleshooter to do what?

    A. isolate the faulty component
    B. recognize what is normal operation
    C. identify the probable cause of a symptom
    D. determine what tools you will need

    Correct answer: B

50. What may be the cause of an AC generator to fail to produce a voltage?

    A. short circuit in the stator coils
    B. speed of the rotor too fast
    C. a tripped bus circuit breaker
    D. an open in the rotor field circuit

    Correct answer: D

51. In the flow of one cycle of single-phase alternating current past any given point in a circuit, how many times will the current peak to a maximum or minimum?

    A. one time
    B. two times
    C. three times
    D. four times

    Correct answer: B

52. Whether analog or digital, what are most AC voltmeters calibrated to measure?

    A. peak-to-peak voltage
    B. average voltage
    C. root-mean-square voltage
    D. peak voltage only

    Correct answer: C

53. What device is best used to test for a short circuit between windings of a three-phase motor that is not running?

    A. ohmmeter
    B. ammeter
    C. voltage tester
    D. infrared temperature meter

    Correct answer: A

54. Wooden shoring is used in shipboard damage control to _____.

    A. force a warped bulkhead back into its normal position
    B. prevent fractures from spreading
    C. force a sprung bulkhead back into place
    D. support a damaged bulkhead in position

    Correct answer: D

55. A direct current passing through a wire coiled around a soft iron core is known as what?

    A. electromagnet
    B. electromagnetic domain
    C. magnetic shield
    D. piezoelectric device

    Correct answer: A

56. Aqueous Film Forming Foam (AFFF), commonly known as "light water", is especially suitable for fighting _____.

    A. oil fires in the engine room bilges
    B. class C fires in paint lockers
    C. any class D fire
    D. all of the above

    Correct answer: A

57. Which line in figure "B" shown in the illustration represents the trailing edge of the wave? Illustration EL-0088

    A. 3
    B. 4
    C. 5
    D. 6

    Correct answer: B

58. What is the whistle signal for stop lowering boats?

    A. 1 short blast of the whistle
    B. 2 short blasts of the whistle
    C. 3 short blasts of the whistle
    D. Continuous blast of the whistle for not less than 3 seconds

    Correct answer: B

59. Which of the following statements is true concerning the valve shown in the illustration? Illustration GS-0047

    A. The valve only requires one turn of the handwheel to fully open.
    B. The valve seats cannot be replaced or repaired.
    C. The valve is normally used to throttle the flow of liquid.
    D. The valve is a non-rising stem design.

    Correct answer: D

60. What would be the voltage drop across the parallel branches of the circuit shown in figure "B" of the illustration if the source voltage is 30 volts, the resistance for R1 is 10 ohms, the resistance for R2 is 10 ohms and the resistance for R3 is 10 ohms? Illustration EL-0032

    A. 5 volts
    B. 10 volts
    C. 20 volts
    D. 30 volts

    Correct answer: B

61. What is the name of the type of motor control circuit that will not permit automatic restarting after power is restored, following a power failure?

    A. reduced voltage restart
    B. low voltage release
    C. low voltage protection
    D. overload lockout

    Correct answer: C

62. In what application is an emergency shutdown most likely to be located outside the machinery space when the pump itself is located within the machinery space?

    A. Fuel oil transfer pump
    B. Lube oil circulating pump
    C. Steering pump
    D. Fire pump

    Correct answer: A

63. 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. 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.
    C. The plates should be bolted together in such a way as to ensure good electrical contact between the plates.
    D. The plates should be bonded together electrically by joining the plates by a bonding strap in addition to bolting together.

    Correct answer: A

64. What is the main purpose of an electric space heater installed in a large AC generator?

    A. prevent the windings from becoming brittle
    B. prevent moisture from condensing in the windings during shutdown
    C. keep the lube oil warm for quick starting
    D. prevent acidic pitting of the slip rings

    Correct answer: B

65. What is a common type of protective covering used on electrical conductors?

    A. Babbitt sheathing
    B. plain paper
    C. rubber or plastic
    D. silver sheathing

    Correct answer: C

66. For a lubricating oil, what is the relationship between viscosity and temperature?

    A. As the temperature of a lubricating oil increases, the viscosity of the lubricating oil also increases.
    B. As the temperature of a lubricating oil varies in either direction, the viscosity of the lubricating oil remains constant.
    C. As the temperature of a lubricating oil increases, the viscosity of the lubricating oil may increase or decrease, depending upon the lubricant.
    D. As the temperature of a lubricating oil increases, the viscosity of the lubricating oil decreases.

    Correct answer: D

67. A definite advantage in the use of water as a fire extinguishing agent is its ability to _____.

    A. rapidly contract as water is converted from a liquid to a vapor
    B. alternate expansion and contraction as water in liquid state becomes vapor
    C. absorb smoke and gases as water is converted from liquid to vapor
    D. vaporize and rapidly expand as water absorbs heat

    Correct answer: D

68. What is the function of the electric brake on a deck cargo winch?

    A. automatically engage when the winch motor current is reaching full load
    B. automatically govern the hoisting speed of the load
    C. automatically hold the load if power to the winch motor is disconnected
    D. automatically govern the lowering speed of the load

    Correct answer: C

69. The illustrated drawing shows a correct front "F" and top "T" view of an object. Of the views labeled "1","2","3", and "4", the one that correctly represents the right side view for a third angle projection is _____. Illustration GS-0132

    A. 1
    B. 2
    C. 3
    D. 4

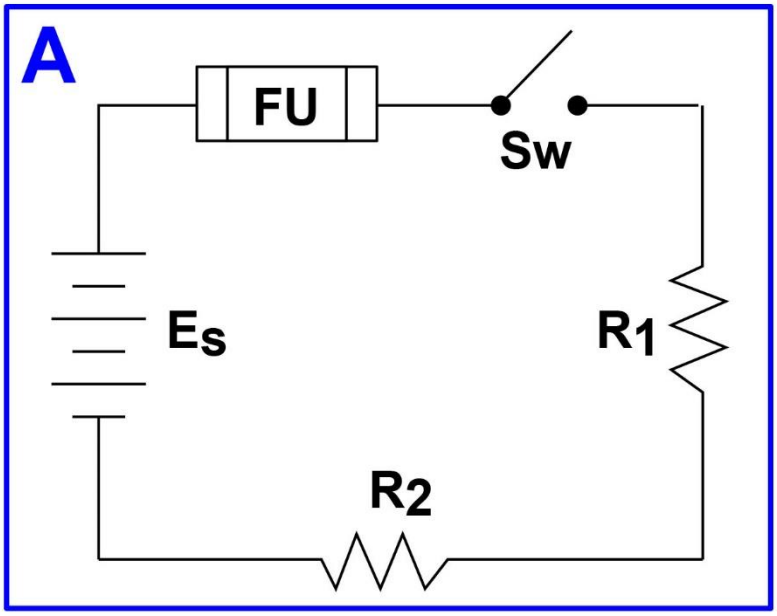
    Correct answer: B

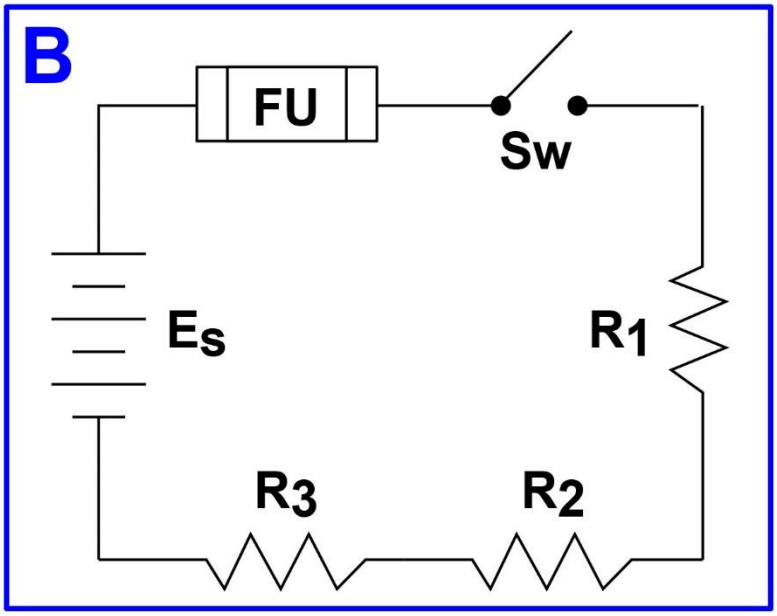
70. In terms of the battery electrolyte, when performing maintenance of alkaline batteries what should be done?

    A. wear protective gloves and goggles when handling electrolyte
    B. check the electrolyte weekly using a hydrometer
    C. replace the electrolyte when the volts per cell drops below 1.8 VDC
    D. replace the electrolyte every 5 years

    Correct answer: A

EL-0020





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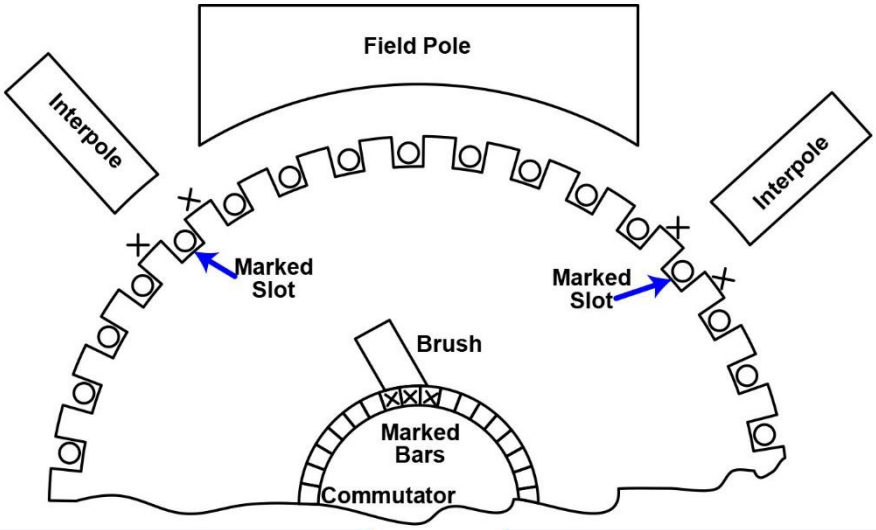

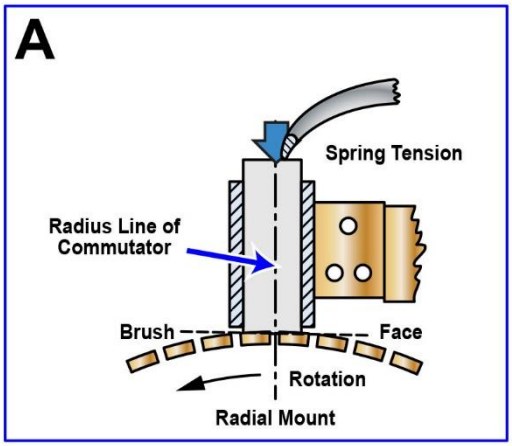

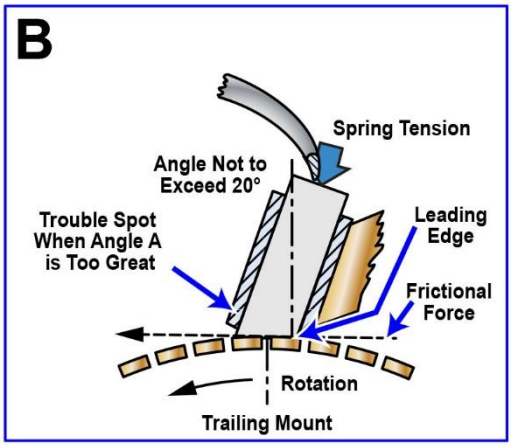

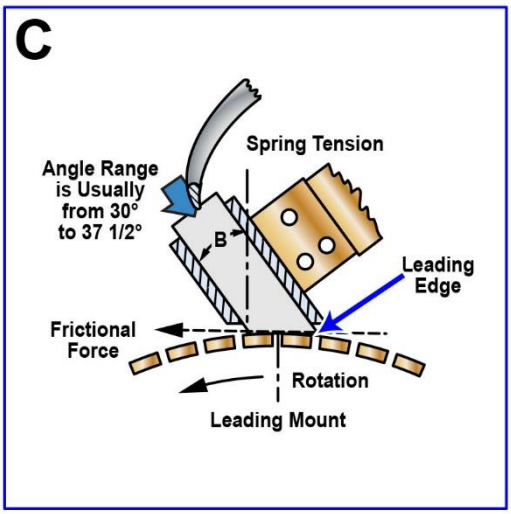

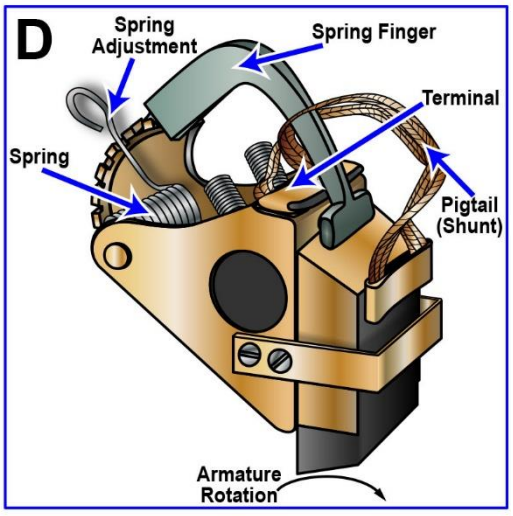

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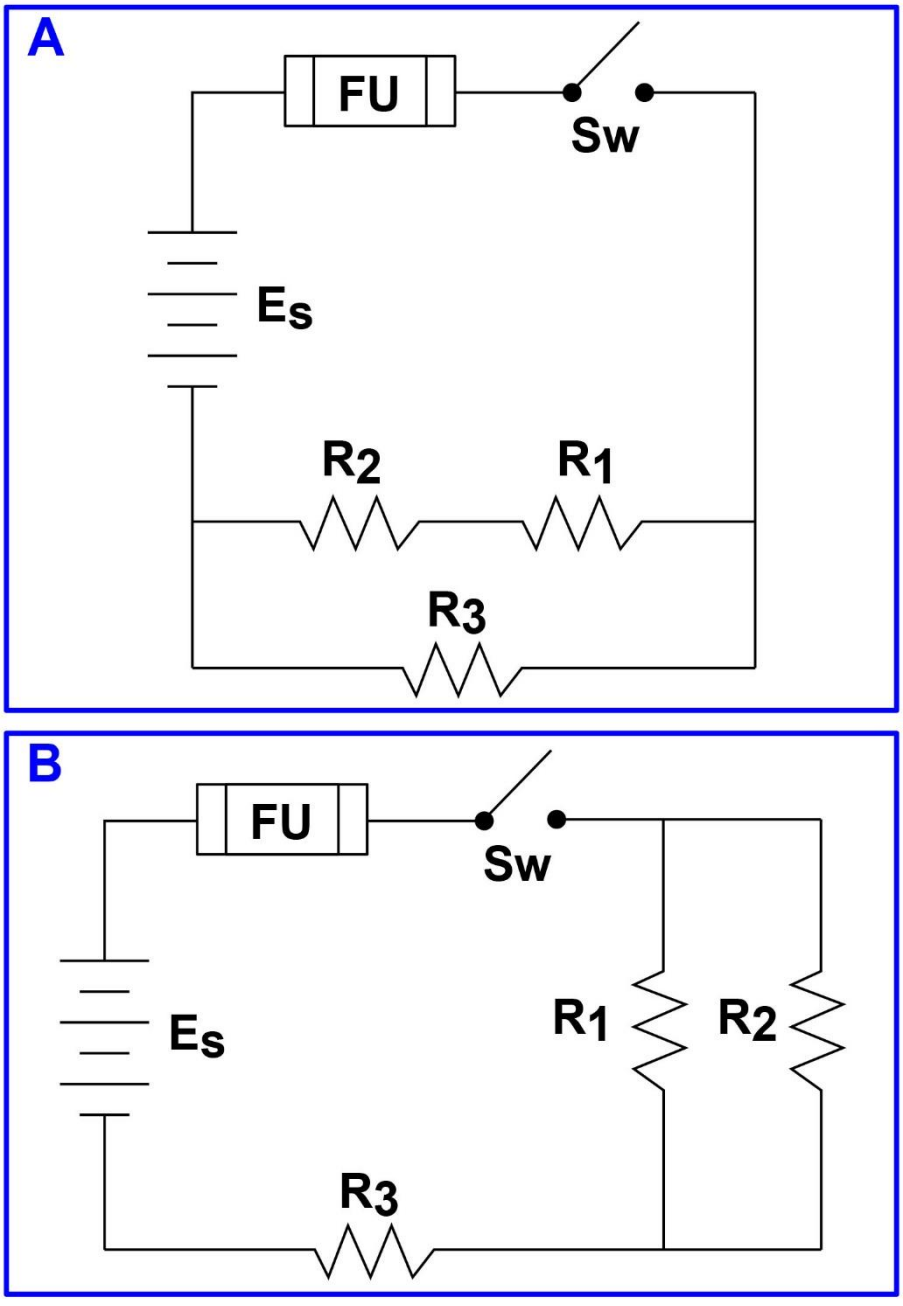

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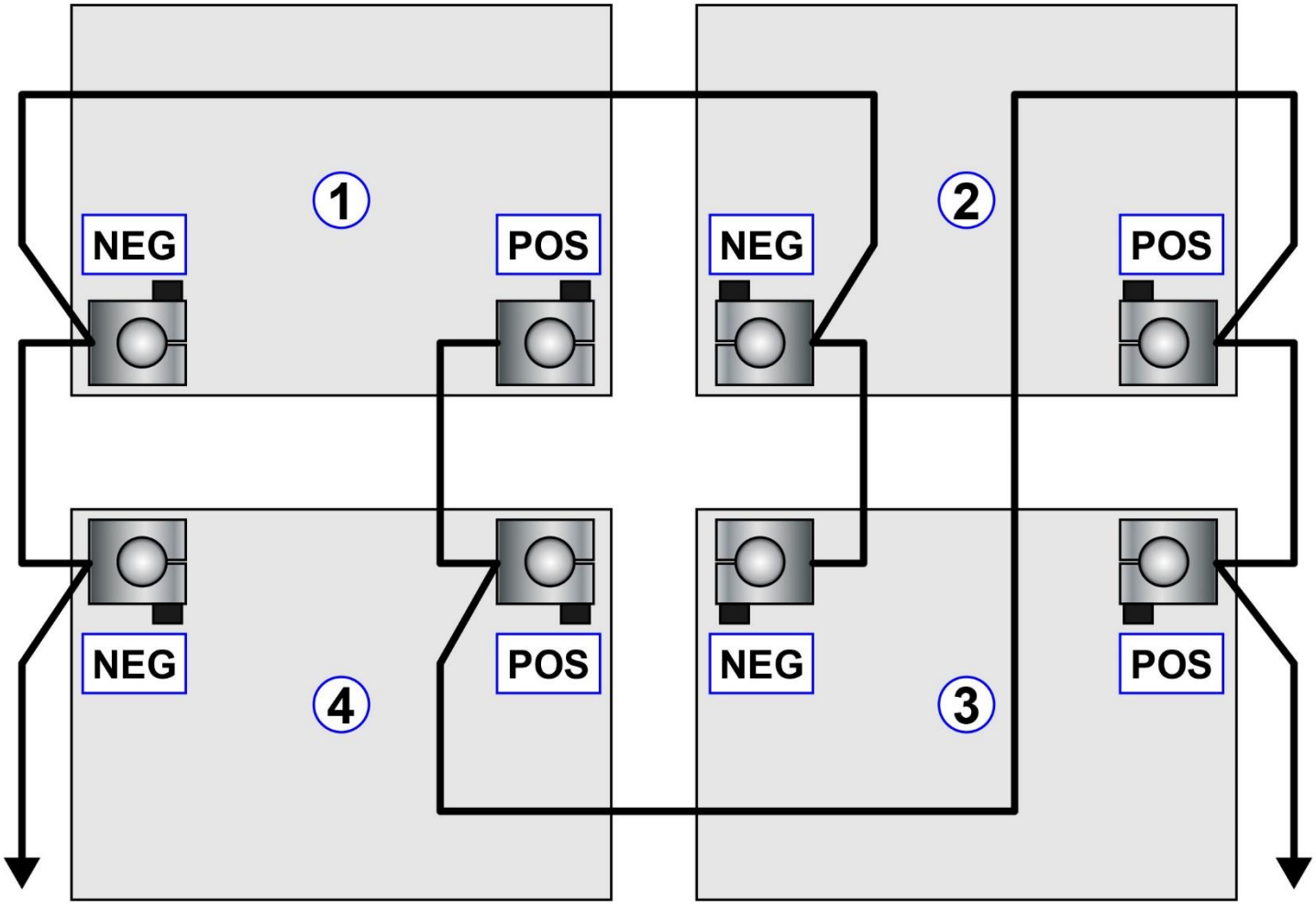

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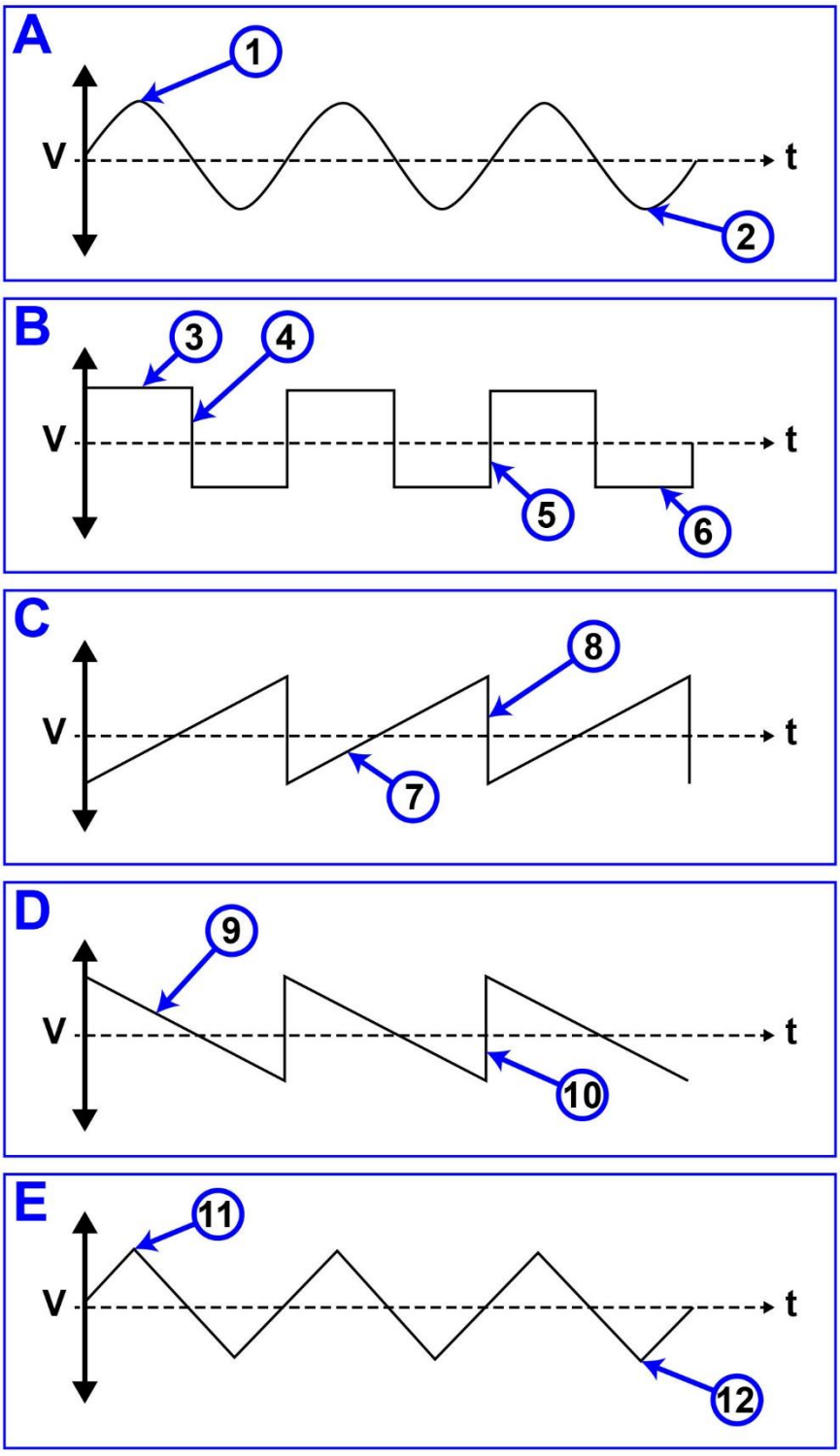

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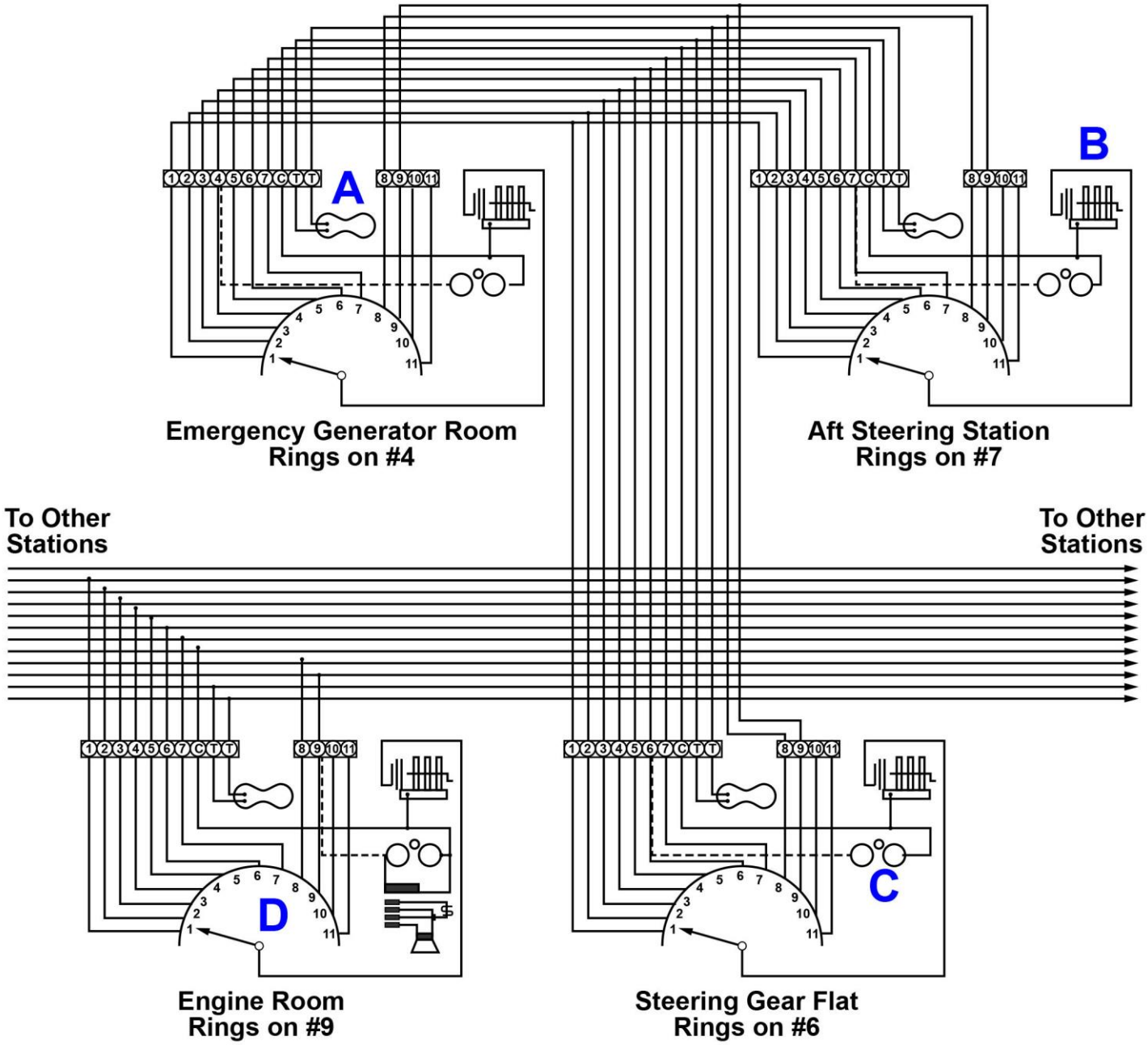

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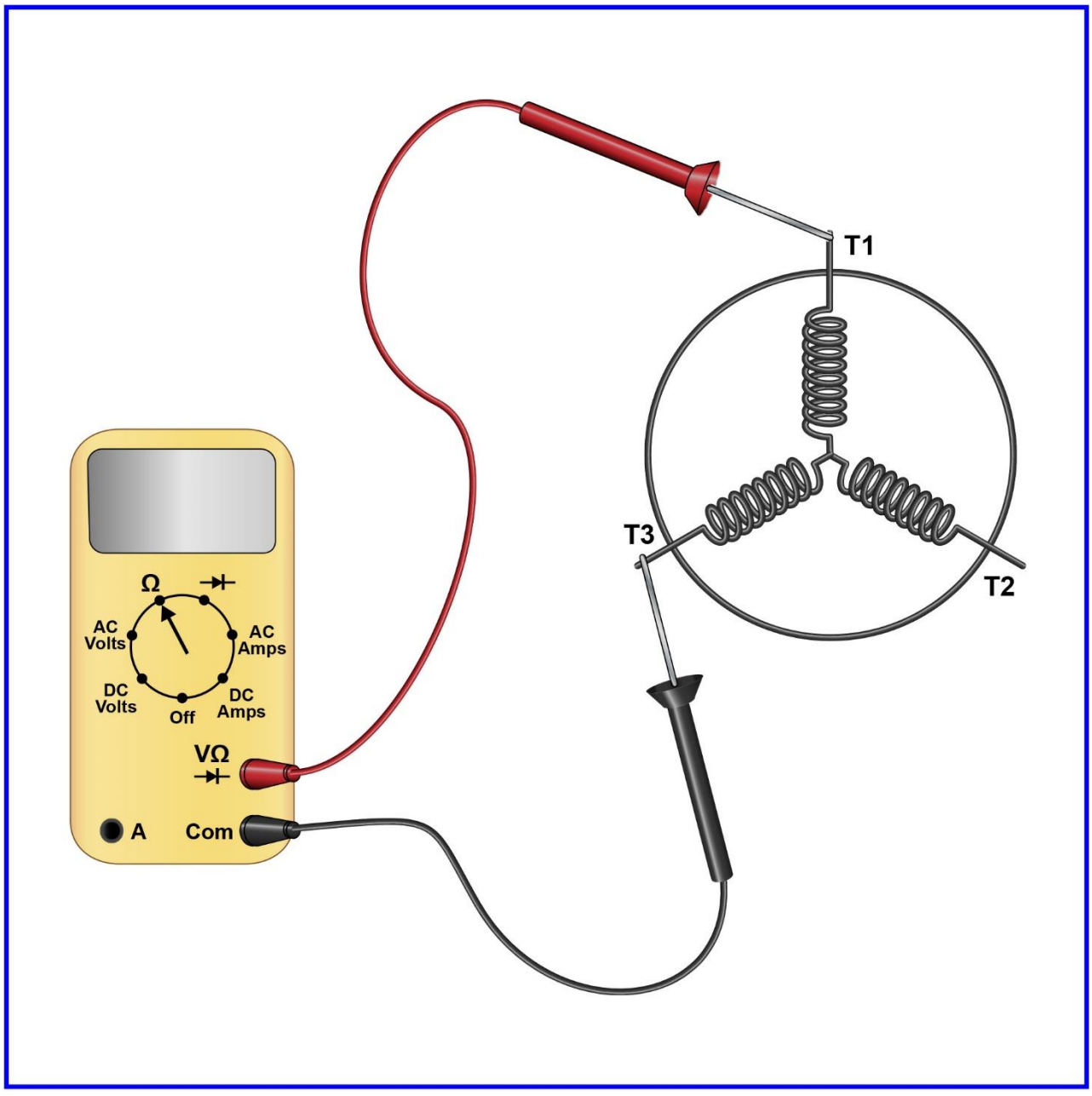

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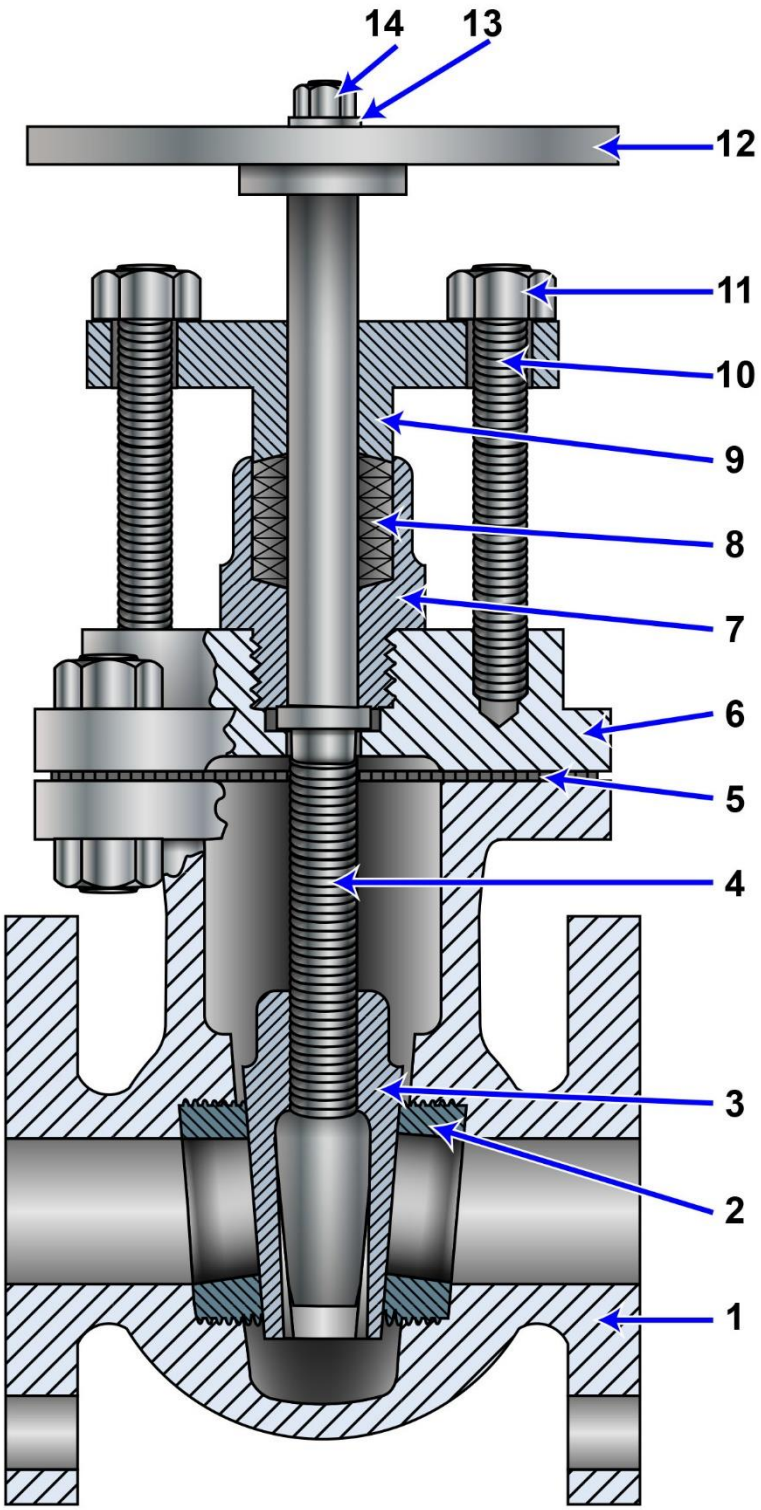

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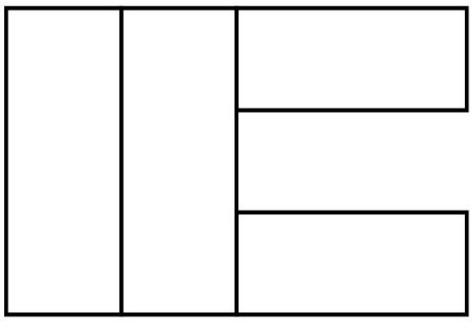

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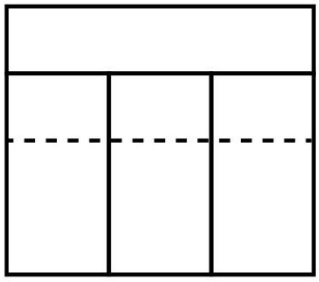

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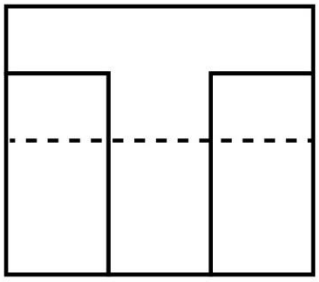

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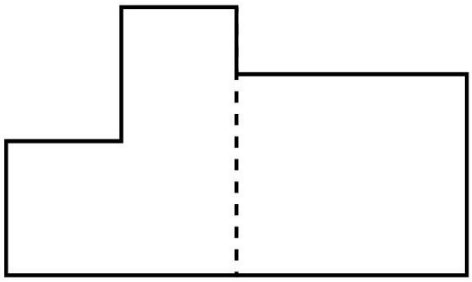

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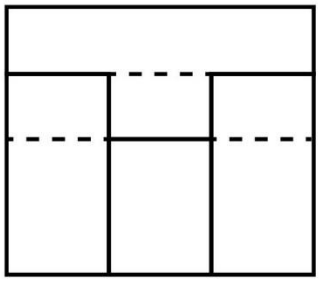

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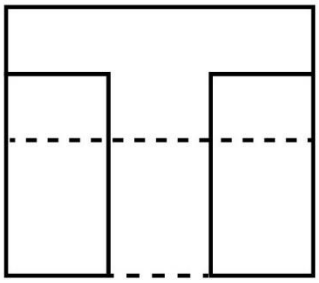

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