U.S.C.G. Merchant Marine Exam

OSV – Chief Engineer

Q680 Motor Plants

(Sample Examination)

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

1. You are assigned to an OSV fitted with main propulsion diesel engines operating on the cycle represented in the polar timing diagram shown in the illustration. When do the exhaust valves open and close respectively? Illustration MO-0084

A. The exhaust valves open at 55o before bottom dead center on the power stroke.
The exhaust valves close at 85o after top dead center on the intake stroke.
B. The exhaust valves open at bottom dead center at the beginning of the exhaust stroke.
The exhaust valves close at top dead center at the end of the exhaust stroke.
C. The exhaust valves open at top dead center at the end of the exhaust stroke.
The exhaust valves close at bottom dead center at the beginning of the exhaust stroke.
D. The exhaust valves open at 85o after top dead center on the intake stroke.
The exhaust valves close at 55o before bottom dead center on the power stroke.

Correct answer: A

2. You are assigned to an OSV fitted with main propulsion diesel engines operating on the cycle represented in the polar timing diagram shown in the illustration. In consideration of the direction of rotation, what combustion cycle event occurs from point "A" to point "D"? Illustration MO-0084

A. Intake
B. Power
C. Compression
D. Exhaust

Correct answer: A

3. You are assigned as an engineer on an anchor handling vessel using main propulsion engines of the type shown in the illustration. Fortunately, with engines of this type, it is possible to inspect the compression rings while in place inside the engine. What would be the indication of properly functioning rings? Illustration MO-0224

A. The rings should be free to move within their grooves, and their faces should have vertical brown streaks.
B. The rings should be free to move within their grooves and their faces should be bright and shiny.
C. The rings should be free to move within their grooves, and their faces should be blackened with carbon.
D. The rings should NOT be free to move within their grooves and their faces should be bright and shiny.

Correct answer: B

4. You are in the process of setting up a system for collecting engine data for trend analysis for the main propulsion engines on your offshore supply vessel. In terms of the conditions under which readings are to be taken and recorded, what statement is true?

A. Data should be collected under conditions of load and speed as variable as possible.
B. Data should be collected under random conditions of load and speed.
C. Data should be collected with no particular concern for conditions of load and speed.
D. Data should be collected under conditions of load and speed that are similar, if not constant.

Correct answer: D

5. You are analyzing the data used for trend analysis for one of the main propulsion diesel engines on the OSV to which you are assigned. The cylinder exhaust temperature of one of the cylinders is significantly lower than the others. When analyzing compression and firing pressure data, however, the numbers are within the normal range for this particular cylinder. What condition would produce these results?

A. Excessive carbon build-up on exhaust pyrometer probe of affected cylinder
B. Excessive carbon build-up on air inlet ports or valves of affected cylinder
C. Leaking exhaust valve on affected cylinder
D. Leaking fuel injector needle valve for affected cylinder

Correct answer: A

6. You are about to perform valve stem to rocker arm clearance adjustments on an auxiliary diesel engine onboard your offshore supply vessel. Which of the following statements concerning hot and cold clearances is true?

A. When comparing hot and cold valve clearances, the hot clearance will always be greater than the cold clearance for a given valve application.
B. When comparing hot and cold valve clearances, the hot and cold valve clearances for a given valve application will always be identical.
C. When comparing hot and cold valve clearances, the hot clearance will always be less than the cold clearance for a given valve application.
D. When comparing hot and cold valve clearances, it is not possible to predict the hot and cold clearances relative to one another for a given valve application.

Correct answer: C

7. When checking the valve stem to rocker arm clearances on an auxiliary diesel engine onboard your OSV, which of the following statements concerning intake and exhaust clearances when taken cold is correct?

A. When taken cold, a properly adjusted exhaust valve clearance would definitely be less than the intake valve clearance.
B. When taken cold, a properly adjusted exhaust valve clearance would definitely be greater than the intake valve clearance.
C. When taken cold, a properly adjusted exhaust valve clearance would definitely be equal to the intake valve clearance.
D. When taken cold, a properly adjusted exhaust valve clearance could be less than or greater than the intake valve clearance.

Correct answer: B

8. An engine that runs rough may indicate a misfiring cylinder. Various techniques associated with disabling the injectors sequentially, in turn, may be used to locate the misfiring cylinder on auxiliary diesel engines of the size used on offshore supply vessels. What type of fuel injectors are disabled for troubleshooting purposes by loosening the high-pressure fuel injection line fitting at the injector nozzle?

A. Hydraulically operated injection nozzles where each nozzle is supplied by separately housed injection pump plungers in a multi-plunger pump.
B. Electronically operated unit injectors where each injection pump plunger and injection nozzle are integrated into one self-contained unit.
C. Mechanically operated injection nozzles where each nozzle is supplied by a separately housed pressure/time (PT) metering pump.
D. Mechanically operated unit injectors where each injection pump plunger and injection nozzle are integrated into one self-contained unit.

Correct answer: A

9. An engine that emits black smoke through the stack may indicate a misfiring cylinder. Assume that the auxiliary diesel engines on your oil platform supply vessel have a fuel injection system that permits the injectors to be disabled for troubleshooting purposes by loosening the high-pressure fuel injection line fitting at the injector nozzle while the engine is running and noting the response of the engine in terms emission of black smoke. Which of the following statements is true?

A. After disabling the injector of a given cylinder, if the engine previously producing a clear exhaust now produces black smoke, this indicates that the cylinder associated with the disabled injector is misfiring.
B. After disabling the injector of a given cylinder, if the engine previously producing black smoke now produces even denser black smoke, this indicates that the cylinder associated with the disabled injector is misfiring.
C. After disabling the injector of a given cylinder, if the engine previously producing black smoke now produces a clear stack, this indicates that the cylinder associated with the disabled injector is misfiring.
D. After disabling the injector of a given cylinder, if the engine previously producing black smoke continues to produce equally dense black smoke, this indicates that the cylinder associated with the disabled injector is misfiring.

Correct answer: C

10. The main engines on your offshore supply vessel utilize a starting system similar to that shown in the illustration. When starting the engine, an excessive amount of oil mist exits the air starter exhaust port. Which of the listed conditions would account for this? Illustration MO-0203

A. The in-line lubricator siphon tube is excessively restricted.
B. Excessive oil within the engine's cylinders is being pumped.
C. The in-line lubricator needle valve degree of opening is insufficient.
D. The in-line lubricator needle valve degree of opening is excessive.

Correct answer: D

11. The lube oil quality management system used on your general-purpose supply vessel requires on board testing of lubricating oil to include testing for viscosity at the same temperature consistently. In terms of viscosity test results, what statement is true?

A. An unusual rise in viscosity indicates excessive oxidation of the lubricating oil OR excessive dilution of the lubricating oil with diesel fuel oil OR BOTH.
B. An unusual drop in viscosity indicates excessive oxidation of the lubricating oil and an unusual rise in viscosity indicates excessive dilution of the lubricating oil with diesel fuel oil.
C. An unusual drop in viscosity indicates excessive dilution of the lubricating oil with diesel fuel oil and an unusual rise in viscosity indicates excessive oxidation of the lubricating oil.
D. An unusual drop in viscosity indicates excessive oxidation of the lubricating oil OR excessive dilution of the lubricating oil with diesel fuel oil OR BOTH.

Correct answer: C

12. When interpreting the engine lube oil supply header pressures for the main engines on your OSV, what statement is true assuming that the lube oil pump is engine-driven?

A. As the lube oil temperature increases, the supply header pressure tends to increase, and as the engine rpm increases, the supply header pressure tends to decrease.
B. As the lube oil temperature increases, the supply header pressure tends to decrease, and as the engine rpm increases, the supply header pressure tends to increase.
C. As the lube oil temperature increases, the supply header pressure tends to decrease, and as the engine rpm increases, the supply header pressure tends to decrease.
D. As the lube oil temperature increases, the supply header pressure tends to increase, and as the engine rpm increases, the supply header pressure tends to increase.

Correct answer: B

13. The diesel fuels burned in auxiliary and main diesel engines of offshore supply vessels serving drilling platforms are required to meet certain specifications. Among these are limits of certain contaminants to limit atmospheric emissions to acceptable levels. Which of the following soluble contaminants is applicable?

A. Total sediment
B. Asphaltenes
C. Sulfur
D. Water

Correct answer: C

14. Concerning the diesel fuels used for the auxiliary and main propulsion diesel engines on-board the offshore supply vessel to which you are assigned, what fuel property is directly a measure of the ignition quality of the fuel?

A. Viscosity
B. Cetane rating
C. Heating value
D. Density

Correct answer: B

15. The manufacturer of the diesel generator set drive engines used aboard your anchor-handling supply vessel recommends that no more than a 2 psig pressure drop across a fuel primary metal-edge suction strainer be allowed before recommended servicing. Assuming that the strainer inlet pressure is 4 psig, what would be the minimum allowable outlet pressure before recommended servicing?

A. 2" Hg
B. 2 psig
C. 6 psig
D. 6" Hg

Correct answer: B

16. Which offshore supply boat diesel fuel oil day tank condition would be most likely to result in water contaminated fuel?

A. Maintaining relatively high day tank levels when the relative humidity of the atmosphere is high.
B. Maintaining relatively high day tank levels when the relative humidity of the atmosphere is low.
C. Maintaining relatively low day tank levels when the relative humidity of the atmosphere is high.
D. Maintaining relatively low day tank levels when the relative humidity of the atmosphere is low.

Correct answer: C

17. You suspect that a diesel generator set on your general-purpose offshore supply vessel has a defective unit injector because the engine, although warm, is running roughly. The two-stroke engine is fitted with mechanically operated unit injectors. When you push and hold down the #3 cylinder injector follower, there is no real change, as the engine continues to run roughly as before. What does this indicate?

A. Either the #4, #5, or #6 cylinder unit injector is faulty. The #1 and #2 cylinder unit injectors are functioning properly.
B. The #3 cylinder unit injector is faulty. You have successfully isolated the faulty unit injector.
C. The #3 cylinder unit injector is functioning properly. One of the other cylinder unit injectors must be faulty.
D. Either the #1 or #2 cylinder unit injector is faulty. The #4, #5 and #6 cylinder unit injectors are functioning properly.

Correct answer: B

18. You suspect that a diesel generator set on your offshore supply boat has a misfiring cylinder because the engine, although warm, is running roughly. The six-cylinder engine is fitted with a high-pressure distributor type pump with hydraulically operated injector nozzles. When you slacken the high-pressure fuel line at #4 fuel injector nozzle, the engine runs even rougher than before. Upon re-tightening the high-pressure fuel line fitting, the engine reverts back to the original roughness before the fitting was slackened. What does this indicate?

A. #4 cylinder is misfiring. You have successfully located the misfiring cylinder.
B. #4 cylinder is firing properly. Any one of the other cylinders must be misfiring.
C. #4 cylinder is misfiring. Either #1, #2, or #3 cylinder is also misfiring.
D. #4 cylinder is misfiring. Either #5 or #6 cylinder is also misfiring.

Correct answer: B

19. The diesel engines on your anchor-handling supply vessel are all protected with dry-type air filters. When changing filter elements what visual indication would cause you to suspect that the engine has been contaminated with dust as the result of improperly sealing of the filter element gasket?

A. The "dirty" side of the air filter housing is coated with dust
B. The "clean" side of the air filter element is streaked with dust
C. The "dirty" side of the air filter element is coated with dust
D. The "clean" side of the air filter element is clean and free of dust

Correct answer: B

20. The turbocharged, four-stroke, diesel generator set drive engines on your OSV are protected with dry-type air intake filters. The filter element condition can be evaluated by attaching a water manometer to measure the vacuum in the air duct between the air intake filter and the turbocharger blower inlet. Assuming that the filter condition is evaluated at rated engine rpm under full load, what statement is true if the restriction associated with a clean, properly sealing filter element is 10" of water column (negative)?

A. A reading of 5" of water column (negative) could indicate that the filter element is restricted with dust or that the filter element is being bypassed due to an improper seal. Either condition is equally likely to result in this reading.
B. A reading of 15" of water column (negative) could indicate that the filter element is restricted with dust or that the filter element is being bypassed due to an improper seal. Either condition is equally likely to result in this reading.
C. A reading of 5" of water column (negative) indicates that the filter element is restricted with dust, and a reading of 15" of water column (negative) indicates that the filter element is being bypassed due to an improper seal.
D. A reading of 15" of water column (negative) indicates that the filter element is restricted with dust, and a reading of 5" of water column (negative) indicates that the filter element is being bypassed due to an improper seal.

Correct answer: D

21. A diesel engine on your platform supply vessel has a restricted exhaust silencer/muffler resulting in high exhaust back pressure. With an appreciable load on the engine, what would be the condition of the exhaust gases exiting the stack?

A. Gray to black smoke
B. Clear, with no smoke
C. Bluish tinge smoke
D. White smoke

Correct answer: A

22. A main propulsion diesel engine on your anchor-handling supply vessel produces gray to black smoke under virtually all load conditions as observed at the stack. The heavier the load on the engine, the darker the smoke becomes. What condition would most likely account for this?

A. Excessively worn exhaust valve guides
B. Leaking exhaust piping expansion joints
C. Leaking exhaust manifold cooling water jackets
D. Excessively restricted exhaust silencer/muffler

Correct answer: D

23. The freshwater cooling systems serving the main engines on your general-purpose supply vessel are arranged as shown in the illustration. If coolant drain valves are inadvertently opened during engine operation, what combination set of symptoms would most likely result? Illustration MO-0138

A. Low level in the jacket water expansion tank. Low freshwater outlet temperature from the engine. Low freshwater pump(s) discharge pressure.
B. Low level in the jacket water expansion tank. High freshwater outlet temperature from the engine. Low freshwater pump(s) discharge pressure.
C. High level in the jacket water expansion tank. High freshwater outlet temperature from the engine. High freshwater pump(s) discharge pressure.
D. Low level in the jacket water expansion tank. High freshwater outlet temperature from the engine. High freshwater pump(s) discharge pressure.

Correct answer: B

24. The freshwater cooling systems serving the main engines on your OSV are arranged as shown in the illustration. If the fresh water thermostatic control valve fails in the position where 100% of the flow from flange "A" is permanently ported to flange "B" and flange "C" is permanently blocked, while starting and warming the engine with no load, what would be the resulting warm up time period? Illustration MO-0137

A. With no load, it is not possible to describe the time frame required to warm up the engine.
B. With no load, the engine would require a much longer than normal time frame to warm up.
C. With no load, the engine would require a much shorter than normal time frame to warm up.
D. With no load, the engine would require a relatively normal time frame to warm up.

Correct answer: D

25. You are inspecting the blower of a Roots-blown, two-stroke cycle main propulsion engine on the anchor-handling supply vessel to which you are assigned and discover the presence of aluminum dust on the rotors and on the air duct surfaces. What would most likely be the direct cause of this?

A. Worn blower rotor shaft seals.
B. Restricted scavenging air intake ports.
C. Worn blower rotor shaft bearings.
D. Restricted blower air intake filter.

Correct answer: C

26. A turbocharged, two-stroke cycle main propulsion diesel engine on your offshore supply vessel is emitting gray to black smoke excessively from the stack. Upon comparing the measured air box pressure against a reference engine which is producing a clear stack, the measured air box pressure is determined to be too low. Which of the following conditions would most likely be the cause for the relatively low air box pressure?

A. Airside aluminum fins on after coolers are excessively restricted.
B. Scavenging air intake ports are excessively restricted with carbon deposits.
C. Turbocharger exhaust turbine inlet screen is excessively restricted.
D. Exhaust silencer/muffler is excessively restricted with carbon deposits.

Correct answer: A

27. The offshore supply vessel to which you are assigned is fitted with reversing reduction gears equipped with airflex pneumatic tire-type friction clutches. With the bridge in control of the main engines, you hear unusual screeching noises coming from the clutches, but only when transitioning from one direction to the other. Given the situation of changing direction from ahead to astern as an example, what is the most likely cause?

A. The EOT handle is being left in neutral and then in astern idle for too long a period of time.
B. The EOT handle is being left in ahead idle and then in neutral for too long a period of time.
C. The EOT handle is being left in ahead idle and then in neutral for too short a period of time.
D. The EOT handle is being left in neutral and then in astern idle for too short a period of time.

Correct answer: D

28. The anchor-handling vessel to which you are assigned is fitted with reversing reduction gears equipped with airflex pneumatic tire-type friction clutches. To maximize clutch efficiency and to minimize clutch wear, in terms of operating clutch supply air pressure what statement is true?

A. If the operating clutch supply air pressure is higher than recommended, the clutch will have a tendency to slip. If the operating clutch supply air pressure is lower than recommended, the clutch will have a tendency to grab.
B. If the operating clutch supply air pressure is maintained either above or below the recommended pressure, the clutch will have a tendency to grab.
C. If the operating clutch supply air pressure is higher than recommended, the clutch will have a tendency to grab. If the operating clutch supply air pressure is lower than recommended, the clutch will have a tendency to slip.
D. If the operating clutch supply air pressure is maintained either above or below the recommended pressure, the clutch will have a tendency to slip.

Correct answer: C

29. The anchor-handling supply boat to which you are assigned is fitted with a totally pneumatic propulsion control system as shown in the illustration. If the astern clutch fails to engage from the engine room control station, but engages properly from all remote-control stations, which of the following system faults best accounts for these symptoms? Illustration MO-0168

A. The control lever at the engine room control station has a blocked astern clutch engagement pilot port.
B. The clutch actuator 4-way control valve at the clutch control panel has a restricted astern clutch quick exhaust port opening.
C. The local/remote transfer valve at the engine room control station has a blocked local port.
D. The astern clutch engagement pilot air tubing has separated from the clutch actuator 4-way control valve at the clutch control panel.

Correct answer: A

30. The offshore supply vessel to which you are assigned is fitted with a totally pneumatic propulsion control system as shown in the illustration. If propulsion control functions perfectly from the engine room control station, but will not function at all from any of the remote stations, which of the following system faults best accounts for these symptoms? Illustration MO-0168

A. The local/remote transfer valve at the engine room control station has a blocked remote port.
B. The attendance valve at the pneumatic remote-control station has a blocked outlet port.
C. The local/remote transfer valve at the engine room control station has a blocked local port.
D. The pilot house/remote transfer valve at the pilot house has a blocked remote port.

Correct answer: A

31. The rated speed of the main propulsion diesel engines on your offshore supply vessel is 900 rpm. The installed centrifugal overspeed trip device similar to the one shown in the illustration is designed to shut down the engine at 110% of rated speed. Upon testing the overspeed trip device, you determine that the actual shutdown occurs at 945 rpm. Which of the following would account for this? Illustration MO-0101

A. The throw-out weight (item #10) pivot bolt (not labeled) is binding within the counterweight (item 1 through 9) drilling.
B. The throw-out weight (item #10) link bolt (item #15 & #16) is binding within the spring guide (item #11) drilling.
C. The compression spring (item #12) was excessively compressed when the overspeed trip was last set.
D. The jam nut (item #14) was not properly tightened against the adjusting nut (items #13) when the overspeed trip was last set.

Correct answer: D

32. A main engine on your general-purpose supply vessel has experienced a low coolant water level alarm even though the water level in the expansion tank is normal. Assuming that the float activated switch is designed to open at low coolant level to activate the alarm, which of the following would account for this?

A. The float switch wire connections are loose at the terminals, not permitting continuity through the switch.
B. The float level switch contacts are welded closed, not permitting the contacts to open.
C. The float is binding in the float chamber, not permitting the float to drop.
D. It is not possible for a low coolant level alarm to occur when the water level is normal.

Correct answer: A

33. You are preparing to change the oil of the speed control governor on one of the main propulsion diesel engines on your OSV. What statement is true concerning the draining and flushing procedures?

A. The governor oil should be drained while the oil is cold and the governor should be flushed with the heaviest grade of the same type of oil.
B. The governor oil should be drained while the oil is hot and the governor should be flushed with the heaviest grade of the same type of oil.
C. The governor oil should be drained while the oil is cold and the governor should be flushed with the lightest grade of the same type of oil.
D. The governor oil should be drained while the oil is hot and the governor should be flushed with the lightest grade of the same type of oil.

Correct answer: D

34. The diesel generator on service on your anchor-handling supply vessel is undergoing cyclic, rhythmic variations in speed at steady load. When the governor output shaft is disconnected from the fuel control linkage and the linkage is blocked manually, these variations in engine speed stop. What would be an appropriate corrective action?

A. Replace the fuel injector nozzle of the misfiring cylinder
B. Tighten the bolts securing the governor base to the engine
C. Make an adjustment at the compensating needle valve
D. Replace the governor drive gears

Correct answer: C

35. What would be the most practical and efficient way of removing soot deposits from the fire-sides of the tubes of an auxiliary water-tube natural-circulation boiler as fitted on your platform supply vessel?

A. Use of a high-pressure water jet
B. Use of a suitable acid
C. Use of a power-driven wire brush
D. Use of an air lance

Correct answer: D

36. Your general-purpose supply vessel is fitted with a coil-type, water-tube, forced-circulation auxiliary boiler. What statement best represents the conditions associated with coil water-sides inspection and cleaning?

A. Coil water-sides are very difficult to inspect AND mechanical cleaning with water jet or wire brush is a practical and efficient method of scale removal.
B. Coil water-sides are very difficult to inspect AND chemical cleaning with a suitable acid is the only practical and efficient method of scale removal.
C. Coil water-sides are relatively easy to inspect AND mechanical cleaning with water jet or wire brush is a practical and efficient method of scale removal.
D. Coil water-sides are relatively easy to inspect AND chemical cleaning with a suitable acid is the only practical and efficient method of scale removal.

Correct answer: B

37. Your oil platform supply vessel is fitted with a two-pass, fire-tube, oil-fired auxiliary boiler. What is the most practical way of determining if the outside surface of the boiler tubes are excessively scaled with hard scale deposits?

A. Measuring the outside diameter of the tubes
B. Monitoring the feed pump pressures
C. Monitoring the circulating pump pressures
D. Performing a visual inspection

Correct answer: A

38. While on deck, you are observing the stack of an oil-fired auxiliary boiler installed on your general-purpose supply vessel. The gases exiting the stack are a dense white smoke. Eliminating water vapor as a possible cause of the white smoke, what would be the correlating flame color as observed through an observation window peephole?

A. Dull or dazzling white flame
B. Yellow flame
C. Yellowish orange or golden yellow flame
D. Reddish flame

Correct answer: A

39. Due to environmental and safety concerns, the towing winch drive diesel engine cooling water system is treated with propylene glycol for protection against freezing. According to the illustration, what would be the limit of protection if 40 pints of propylene glycol are used in treating a cooling water system with a volumetric capacity of 10 gallons? Illustration MO-0209

A. 10oF
B. -6oF
C. -30oF
D. -53oF

Correct answer: C

40. In a closed, recirculating freshwater cooling system used for the diesel-generators on your offshore supply vessel, what function would chemical treatment with organic phosphates primarily perform?

A. Freezing point depression
B. Corrosion inhibition
C. Scale control and suppression
D. Biological growth inhibition

Correct answer: C

41. A main diesel engine on your platform supply vessel has experienced a safety shutdown due to excessive crankcase pressure. What is the appropriate response?

A. Immediately restart the engine and monitor the crankcase pressure to verify the cause of the shutdown.
B. Allow 2 hours for the engine to cool before opening the crankcase and determine and correct the cause of the trip before attempting to restart the engine.
C. Allow the engine to cool off for two minutes, then restart and monitor the crankcase pressure to verify the cause of the shutdown.
D. Immediately open the crankcase to make the necessary inspections to determine the cause of the high crankcase pressure safety shutdown.

Correct answer: B

42. You are attempting to start a deck winch drive engine fitted with an electric cranking motor where the battery electrolyte is frozen. What should be done to facilitate starting?

A. The battery electrolyte should be allowed to thaw, and then the battery should be recharged as necessary before attempting to start the engine.
B. The engine should be started by means of jumper cables connected to another battery without any particular concern regarding the electrolyte being frozen.
C. The battery electrolyte should be thawed by means of a battery charger, and then the battery should be recharged as necessary before attempting to start the engine.
D. The battery electrolyte should be allowed to thaw, and then the battery electrolyte should be diluted with distilled water as necessary before attempting to start the engine.

Correct answer: A

43. When rolling over a main engine on your anchor handling vessel prior to starting with the cylinder test valves open to expel any fluids accumulated within the cylinders, a rather large amount of water is discharged. What is the appropriate response?

A. Do not allow the engine to be started until the cause of the water discharge has been determined and corrected.
B. Start the engine, but run the engine with the cylinder test valves cracked slightly open.
C. Start the engine, but maintain the jacket water expansion tank level higher than normal.
D. Start the engine, but monitor all fluid levels very closely, especially that of the jacket water.

Correct answer: A

44. While warming up the main engines on your offshore utility vessel while tied up at your own pier, one of the main engines suddenly sounds the low lube oil pressure alarm. What is the appropriate initial response?

A. Immediately shutdown the engine, then investigate the cause for the low-pressure alarm.
B. Monitor closely oil pressures, temperatures, and levels while continuing to run the engine.
C. Immediately add make-up oil or service lube oil coolers, strainers, and filters, as appropriate.
D. Reduce the load and speed on the engine and continue to monitor the oil pressure.

Correct answer: A

45. You are assigned to an offshore supply vessel fitted with main propulsion diesel engines of the type shown in the illustration. How many degrees of crankshaft revolution are required for all of the engine's cylinders to fire? Illustration MO-0224

A. 180 degrees
B. 360 degrees
C. 720 degrees
D. Not enough information is given to determine crankshaft degrees of revolution.

Correct answer: B

46. When checking the crankcase oil level on a main propulsion engine on your offshore oil spill response vessel while underway, what should be the oil level as indicated on the dipstick?

A. The actual level is unimportant as long as it is visible on the dipstick when the engine is running.
B. The level should be well above the FULL mark on the side of the dipstick marked with engine IDLE and oil HOT.
C. The level should be between the FULL and ADD marks on the side of the dipstick marked with engine IDLE and oil HOT.
D. The level should be below the ADD mark on the side of the dipstick marked with engine IDLE and oil HOT.

Correct answer: C

47. When starting a deck winch drive engine in preparation for cargo handling operations, what parameter must be checked FIRST upon start-up to avoid immediate engine damage?

A. Cylinder jacket water pump discharge pressure
B. Fuel oil supply header pressure
C. Engine lubricating oil supply header pressure
D. Deck winch gear oil pump discharge pressure

Correct answer: C

48. Various diesel engines onboard your offshore supply vessel are started by means of either vane-type or air-turbine air-starting motors. At a minimum, in the absence of automatic drain valves, how often should moisture separators be drained of moisture while the vessel is underway?

A. Hourly
B. Daily
C. Weekly
D. Monthly

Correct answer: B

49. A diesel generator set on your anchor-handling supply vessel has a simplex lube oil strainer of the type shown in the illustration, situated on the discharge side of the lube oil pump. At a specified engine rpm and lube oil temperature, you notice that the inlet pressure is increasing and the outlet pressure is decreasing, resulting in an unacceptable pressure drop. What should be done? Illustration MO-0057

A. While the engine is running, the cleaning handle (A) should be rotated one or more full turns to remove the accumulated dirt from the disk stack (C).
B. While the engine is running, the drain plug (B) should be carefully loosened to drain the sludge from the strainer sump.
C. The drain plug (B) is removed to drain the sludge from the strainer sump, but the engine must be stopped to perform this operation.
D. While the engine is running, the cleaning handle (A) should be rotated one-half turn to remove the accumulated dirt from the disk stack (C).

Correct answer: A

50. The main propulsion diesel engines on your anchor-handling supply vessel are fitted with conventional hydraulically operated injector nozzles of the orifice type. When testing an injector by performing a pop-test on an injector test stand, you observe no leakage prior to reaching the popping pressure, the pressure holds at just below the popping pressure, the actual popping pressure is within specification, but the spray pattern is distorted. What maintenance is required?

A. The injector spring compression must be readjusted or a broken spring replaced.
B. The injector spindle and nozzle holder bore must be reconditioned or replaced.
C. The injector nozzle tip orifices must be reconditioned by cleaning or the tip replaced.
D. The injector needle valve and seat must be reconditioned or replaced.

Correct answer: C

51. The diesel generator set drive engines on your offshore supply boat are protected with heavy-duty oil bath air cleaners. The oil within these air cleaners should be periodically replaced in accordance with manufacturer recommendations. What statement best describes when it would be appropriate to deviate from the recommended frequency?

A. Replace the oil less frequently when the engine is exposed to dusty conditions (such as arc welding in the engine room), and replace the oil more frequently when the oil is unusually dirty or when it thickens.
B. Replace the oil less frequently when the engine is exposed to dusty conditions (such as arc welding in the engine room), and replace the oil less frequently when the oil is unusually dirty or when it thickens.
C. Replace the oil more frequently when the engine is exposed to dusty conditions (such as arc welding in the engine room), and replace the oil more frequently when the oil is unusually dirty or when it thickens.
D. Replace the oil more frequently when the engine is exposed to dusty conditions (such as arc welding in the engine room), and replace the oil less frequently when the oil is unusually dirty or when it thickens.

Correct answer: C

52. Water-jacketed exhaust manifolds as used on anchor-handling supply vessel main engines require periodic inspection of the jackets and scale removal as necessary. What would be the impact of a failure to remove scale deposits on a timely basis?

A. Excessive scale deposits would increase heat transfer and raise the temperature of the inside wall of the exhaust manifold.
B. Excessive scale deposits would decrease heat transfer and raise the temperature of the inside wall of the exhaust manifold.
C. Excessive scale deposits would decrease heat transfer and lower the temperature of the inside wall of the exhaust manifold.
D. Excessive scale deposits would increase heat transfer and lower the temperature of the inside wall of the exhaust manifold.

Correct answer: B

53. Your platform supply vessel is fitted with cooling water systems serving the main propulsion diesel engines as shown in the illustration. Which heat exchanger/cooler application and aspect would most likely require periodic mechanical cleaning with a specially designed brush? Illustration MO-0137

A. The outside of the tubes of the RW/FW heat exchanger
B. The outside of the tubes of the lube oil cooler
C. The inside of the tubes of the RW/FW heat exchanger
D. The inside of the tubes of the lube oil cooler

Correct answer: C

54. The turbochargers on the main propulsion engines on the OSV to which you are assigned are fitted with an exhaust inlet screen to protect the turbocharger turbine. Upon inspection, pieces of broken piston rings or exhaust valves are found in the foreign object trap box. Besides removing this debris, with respect to the screen what should be done?

A. The screen should be magnafluxed to check for damage not visible to the naked eye.
B. The screen should be replaced only when damage is obvious to the naked eye.
C. The screen should be replaced without conducting any further checking or investigation.
D. The screen should be placed in a press to remove any indentations from impingement.

Correct answer: A

55. The lubricating oil system supporting the main propulsion reduction gear on your offshore supply vessel is fitted with a lube oil strainer as shown in the illustration. How often should the handle "A" be rotated for cleaning purposes? Illustration MO-0057

A. Once per watch while underway
B. Once per month
C. Once every six months
D. Once per year

Correct answer: A

56. The pneumatic propulsion control system used on your offshore supply vessel is configured as shown in the illustration. In terms of clutch air system maintenance, what statement best represents operational requirements? Illustration MO-0168

A. Whereas the cleanliness of clutch air is critical, the dryness and pressure are clutch air are of secondary concern.
B. Whereas the clutch air pressure is critical, the dryness and cleanliness of the clutch air are of secondary concern.
C. Whereas the dryness of clutch air is critical, the pressure and cleanliness of the clutch air are of secondary concern.
D. The pressure, dryness, and cleanliness of clutch air are all critical to successful pneumatic propulsion control operations.

Correct answer: D

57. The main diesel propulsion engines on your offshore supply vessel are protected with a mechanical overspeed trip mechanism similar to that shown in the illustration. Upon testing the trip setting, you discover that it is necessary to make an adjustment. Assuming that several adjustments may be necessary before the final setting is accurately achieved, what statement concerning adjustment is true? Illustration MO-0101

A. To adjust the overspeed trip, the engine must be stopped AND the locknut must be retightened after each adjustment.
B. To adjust the overspeed trip, the engine must be running AND the locknut must be retightened only after the final adjustment.
C. To adjust the overspeed trip, the engine must be stopped AND the locknut must be retightened only after the final adjustment.
D. To adjust the overspeed trip, the engine must be running AND the locknut must be retightened after each adjustment.

Correct answer: A

58. The auxiliary oil-fired water-tube steam boiler on your platform supply vessel is equipped with a water column similar to that shown in the illustration. Assuming that the water level is at the normal operating water level (NOWL) of the boiler, what would be the result of alternately opening and reclosing each of the water column tricocks? Illustration MO-0093

A. Steam should issue from the uppermost tricock, and water should issue from both the middle and lowermost tricocks.
B. Water should issue from each of the uppermost, middle, and lowermost tricocks.
C. Steam should issue from both the uppermost and middle tricocks, and water should issue from the lowermost tricock.
D. Steam should issue from the uppermost tricock, and water should issue from lowermost tricock. Either steam or water could issue from the middle tricock.

Correct answer: D

59. Due to the questionable mineral content of fresh water taken on from shore as a source of make-up water for diesel engine closed, recirculating cooling water systems, besides chemical treatment and coolant testing, what is the best line of defense in minimizing cooling system problems?

A. Maintaining a tight system and promptly repairing leaks
B. Increasing the frequency of draining, flushing, and re-filling the system
C. Maintaining cooling water temperatures at lower-than-normal values
D. Maintaining cooling water temperatures at higher-than-normal values

Correct answer: A

60. What statement concerning fuel cetane rating and the ignition delay period is true as it applies to offshore anchor handling vessel main propulsion diesel engines?

A. The ignition delay period is the lag in time between when fuel injection is initiated and when fuel injection actually begins, and the higher the cetane rating of the fuel the shorter the ignition delay period.
B. The ignition delay period is the lag in time between when fuel injection actually begins and when combustion actually begins, and the higher the cetane rating of the fuel the longer the ignition delay period.
C. The ignition delay period is the lag in time between when fuel injection is initiated and when fuel injection actually begins, and the higher the cetane rating of the fuel the longer the ignition delay period.
D. The ignition delay period is the lag in time between when fuel injection actually begins and when combustion actually begins, and the higher the cetane rating of the fuel the shorter the ignition delay period.

Correct answer: D

61. The drilling platform supply vessel to which you are assigned has diesel generators fitted with unit injectors of the type shown in the illustration. What statement is true concerning the operation of unit injectors of this type? Illustration MO-0143

A. Pressurization of the fuel is accomplished by the mechanically operated rocker arm, and the timing and metering of the fuel is accomplished by the electronically controlled solenoid.
B. Pressurization of the fuel is accomplished by the electronically controlled solenoid, and the timing and metering of the fuel is accomplished by the mechanically operated rocker arm.
C. Pressurization and metering of the fuel is accomplished by the mechanically operated rocker arm, and the timing of the fuel is accomplished by the electronically controlled solenoid.
D. Pressurization and timing of the fuel is accomplished by the mechanically operated rocker arm, and the metering of the fuel is accomplished by the electronically controlled solenoid.

Correct answer: A

62. The offshore supply vessel to which you are assigned has diesel generators fitted with fuel injectors of the type shown in figure "2" of the illustration. What statement is true concerning this type of injector? Illustration MO-0150

A. The injector is of the open type and features pressure-time metering.
B. The injector is of the closed type and features pressure-time metering.
C. The injector is of the open type and features port and helix metering.
D. The injector is of the closed type and features port and helix metering.

Correct answer: D

63. The platform construction support vessel to which you are assigned has a deck winch drive engine fitted with fuel injectors with the operating principle as shown in the illustration. In figure "A" which plunger travel position corresponds to when fuel injection begins? Illustration MO-0144

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

Correct answer: B

64. The offshore supply vessel to which you are assigned has diesel generators fitted with injectors with the operating principle as shown in the illustration. What statement is true concerning the metering principle used in this system? Illustration MO-0146

A. The amount of fuel injected is dependent upon the cylinder compression pressure and the cylinder compression temperature.
B. The amount of fuel injected is dependent upon the pressure of the inlet fuel to the injector and the length of time the orifice is open during metering.
C. The amount of fuel injected is dependent upon the distance of plunger travel.
D. The amount of fuel injected depends upon the injector pre-load torque setting.

Correct answer: B

65. The freshwater cooling systems serving the main engines of your offshore supply vessel are of the type shown in the illustration. What statement accurately describes the characteristics of the freshwater cooling circuit? Illustration MO-0137

A. The freshwater circuit is a pressurized system using a stationary/marine type 3-way thermostatic control valve for temperature control.
B. The freshwater circuit is a pressurized system using an automotive type 2-way thermostatic control valve for temperature control.
C. The freshwater circuit is a vented system using an automotive type 2-way thermostatic control valve for temperature control.
D. The freshwater circuit is a vented system using a stationary/marine type 3-way thermostatic control valve for temperature control.

Correct answer: D

66. The auxiliary engines on the offshore supply vessel to which you are assigned are fitted with Roots-blowers as shown in the illustration. What statement is true concerning the timing gears as shown in figure "A"? Illustration MO-0135

A. The timing gears are helically cut and ensure that the blower is properly timed to the engine's crankshaft.
B. The timing gears are helically cut and ensure that the blower rotor lobes are properly spaced apart with a close tolerance.
C. The timing gears are straight cut and ensure that the blower is properly timed to the engine's crankshaft.
D. The timing gears are straight cut and ensure that the blower rotor lobes are properly spaced apart with a close tolerance.

Correct answer: B

67. The multi-purpose supply vessel to which you are assigned is fitted with main propulsion reduction gears as shown in the illustration. What statement is true concerning this type of reduction gear? Illustration MO-0142

A. This type of reduction gear is used with a controllable pitch propeller and a reversing engine.
B. This type of reduction gear is used with a fixed pitch propeller and a reversing engine.
C. This type of reduction gear is used with a fixed pitch propeller and a non-reversing engine.
D. This type of reduction gear is used with a controllable pitch propeller and a non-reversing engine.

Correct answer: C

68. The oil platform supply vessel to which you are assigned has a pneumatic propulsion control system as shown in the illustration. When the mechanical slave remote control station is being used to control propulsion, what is the direct result of positioning the control lever in the ahead direction? Illustration MO-0168

A. Movement of the mechanical slave remote control station lever directly shifts the pneumatic remote control station lever control valve spool by the action of a chain or cable which results in pneumatic shifting of the clutch actuator 4-way control valve to the ahead direction.
B. Movement of the mechanical slave remote control station lever directly shifts the engine room control station lever control valve spool by the action of a chain or cable which results in pneumatic shifting of the clutch actuator 4-way control valve to the ahead direction.
C. Movement of the mechanical slave remote control station lever directly shifts the clutch actuator 4-way control valve to the ahead direction by the action of a chain or cable.
D. Movement of the mechanical slave remote control station lever directly shifts the pilot house pneumatic master control station lever control valve spool by the action of a chain or cable which results in pneumatic shifting of the clutch actuator 4-way control valve to the ahead direction.

Correct answer: D

69. The platform supply vessel to which you are assigned has a pneumatic propulsion control system as shown in the illustration. What statement is true concerning transfer of control? Illustration MO-0168

A. The transfer valve at the pilot house pneumatic master control station is used to transfer control of propulsion from the pilot house master control station to the engine room control station or vice versa.
B. The transfer valve at the engine room control station is used to transfer control of propulsion from the engine room control station to the pilot house pneumatic master control station or vice versa.
C. The transfer valve at the pneumatic remote-control station is used to transfer control of propulsion from the pneumatic remote-control station to the mechanical slave remote control station or vice versa.
D. The transfer valve at the pilot house pneumatic master control station is used to transfer control of propulsion from the pilot house master control station to the mechanical slave remote control station or vice versa.

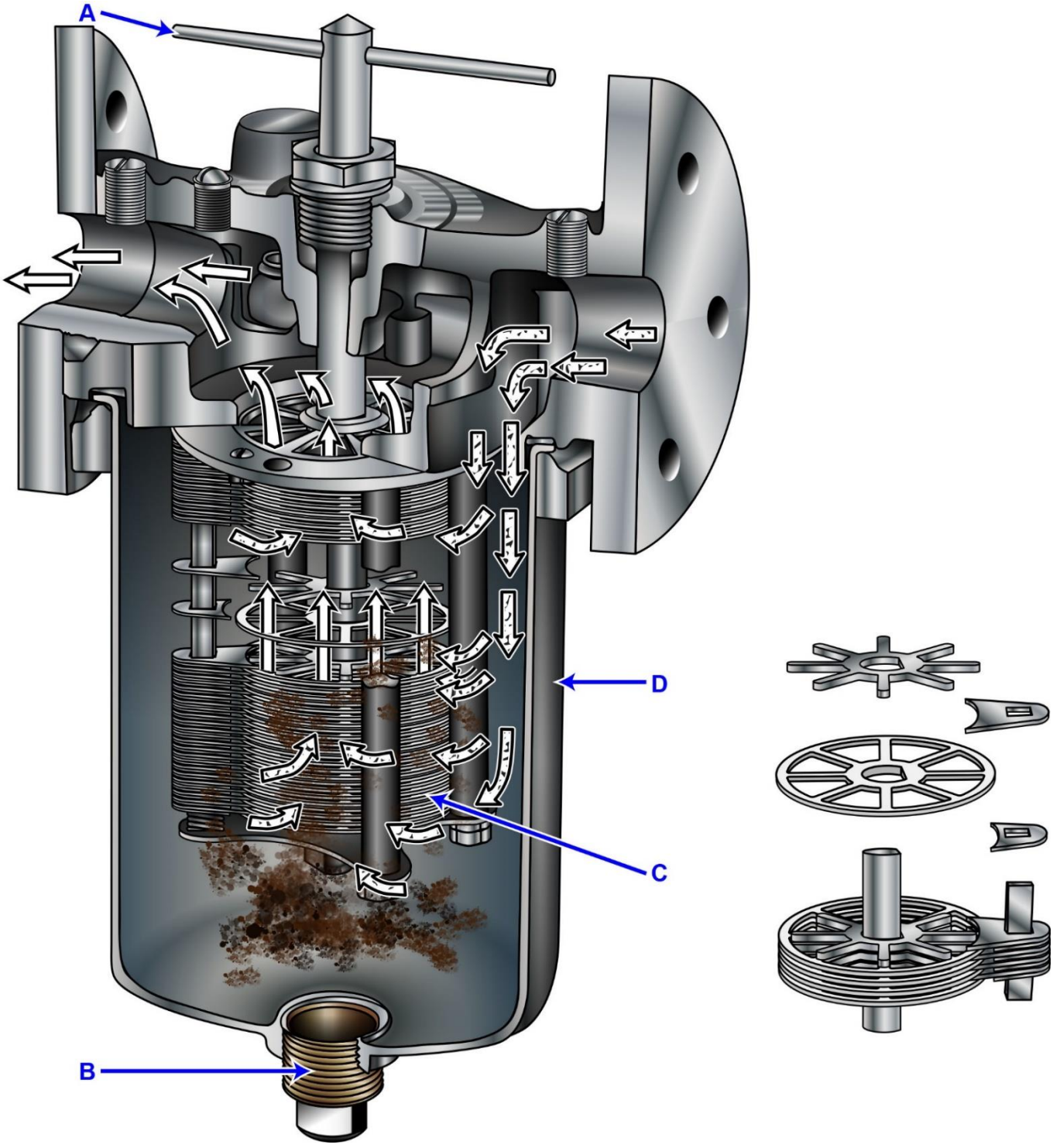
Correct answer: B

70. The main engines on your anchor handling supply vessel are equipped with manual shutdown levers as shown in the illustration. What statement concerning manual shutdown is true? Illustration MO-0171

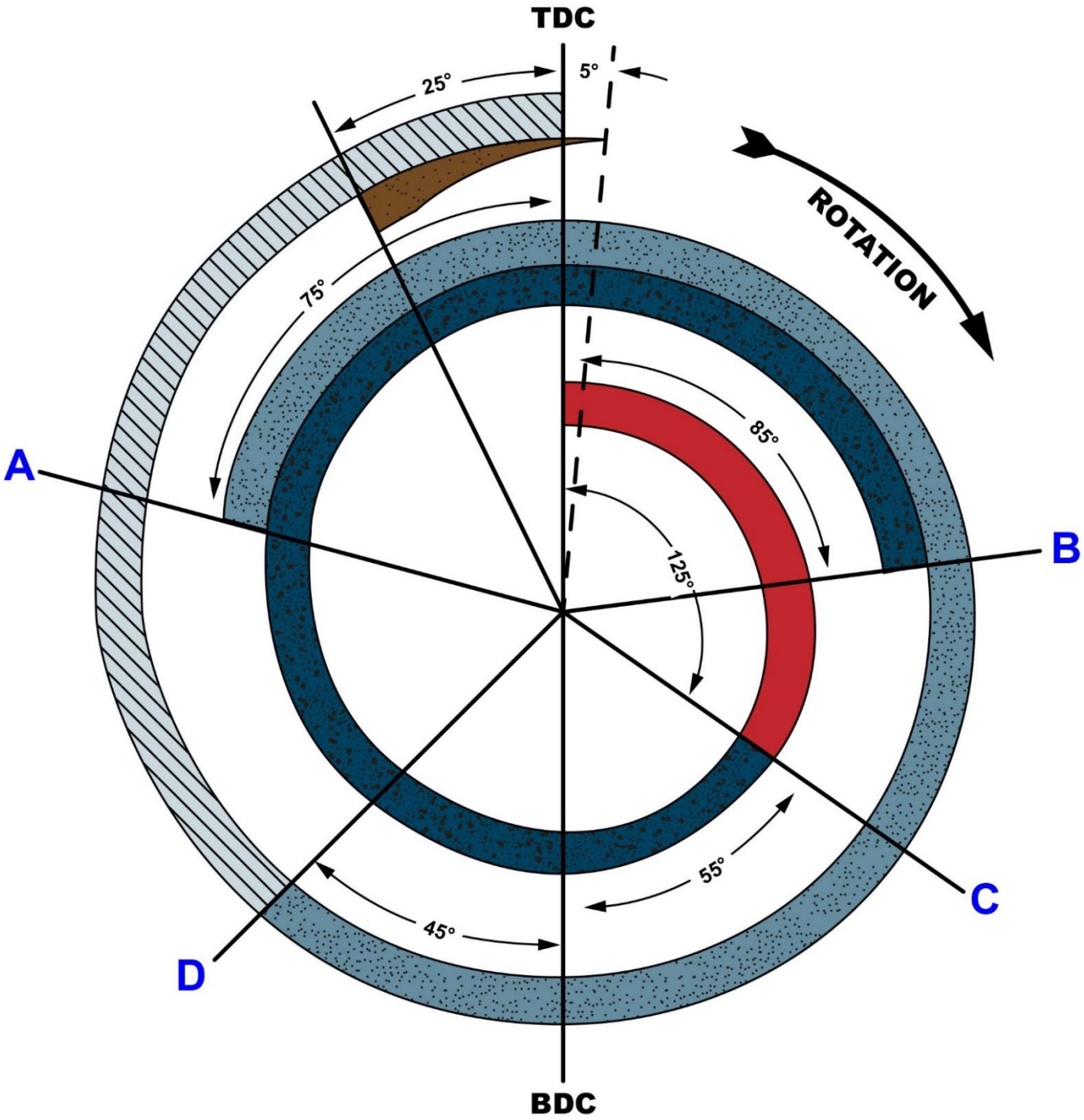
A. The manual shutdown lever is operated by means of a remote pull cable and uses the over speed trip mechanism to accomplish engine shutdown.
B. The manual shutdown lever is operated by means of the emergency trip reset lever and uses the governor fuel control linkage.
C. The manual shutdown lever is operated by means of the over speed trip reset lever and uses the over speed trip mechanism to accomplish engine shutdown.
D. The manual shutdown lever is operated by means of a remote pull cable and uses the governor fuel control linkage to accomplish engine shutdown.

Correct answer: A

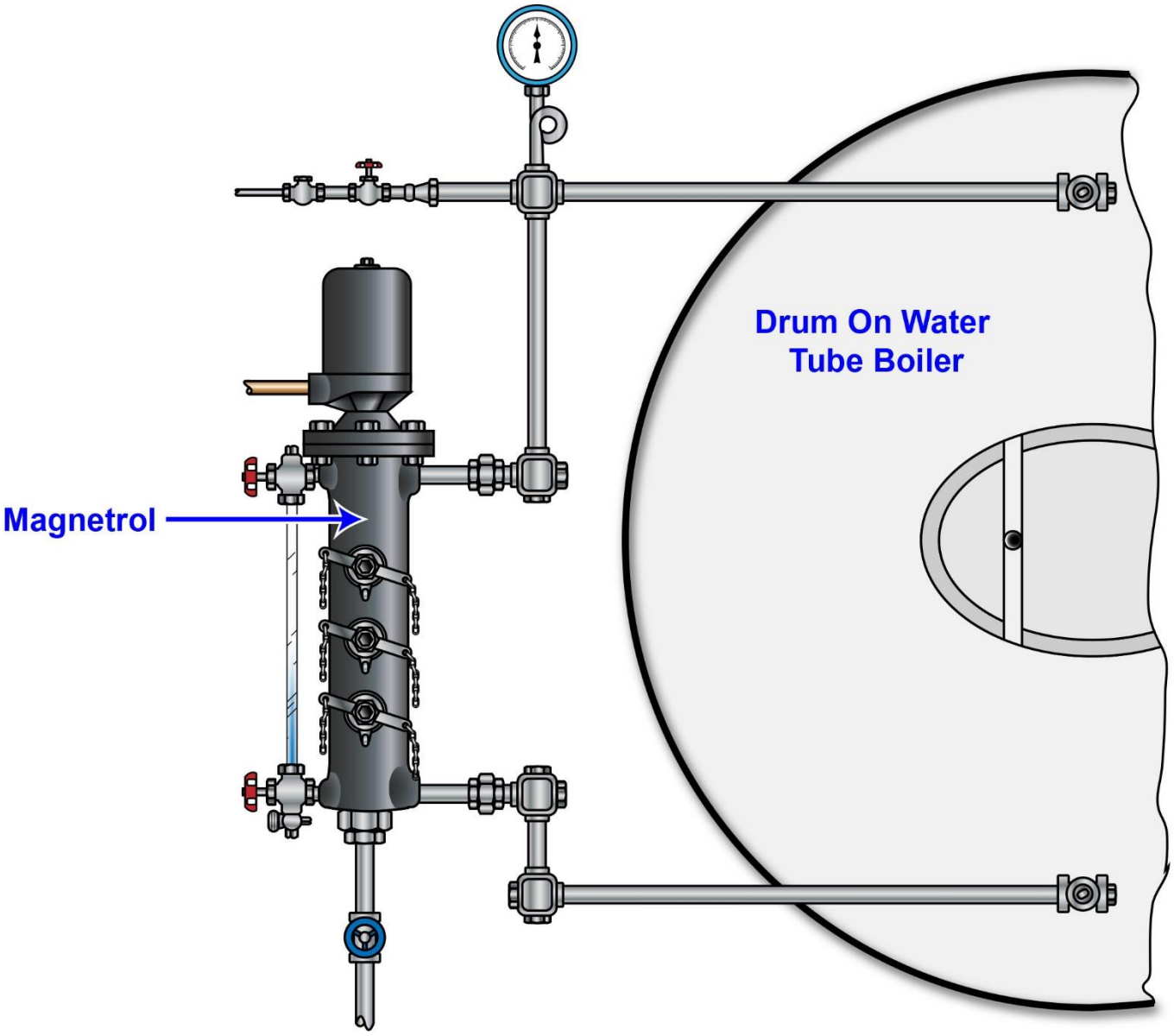
MO-0057



MO-0084

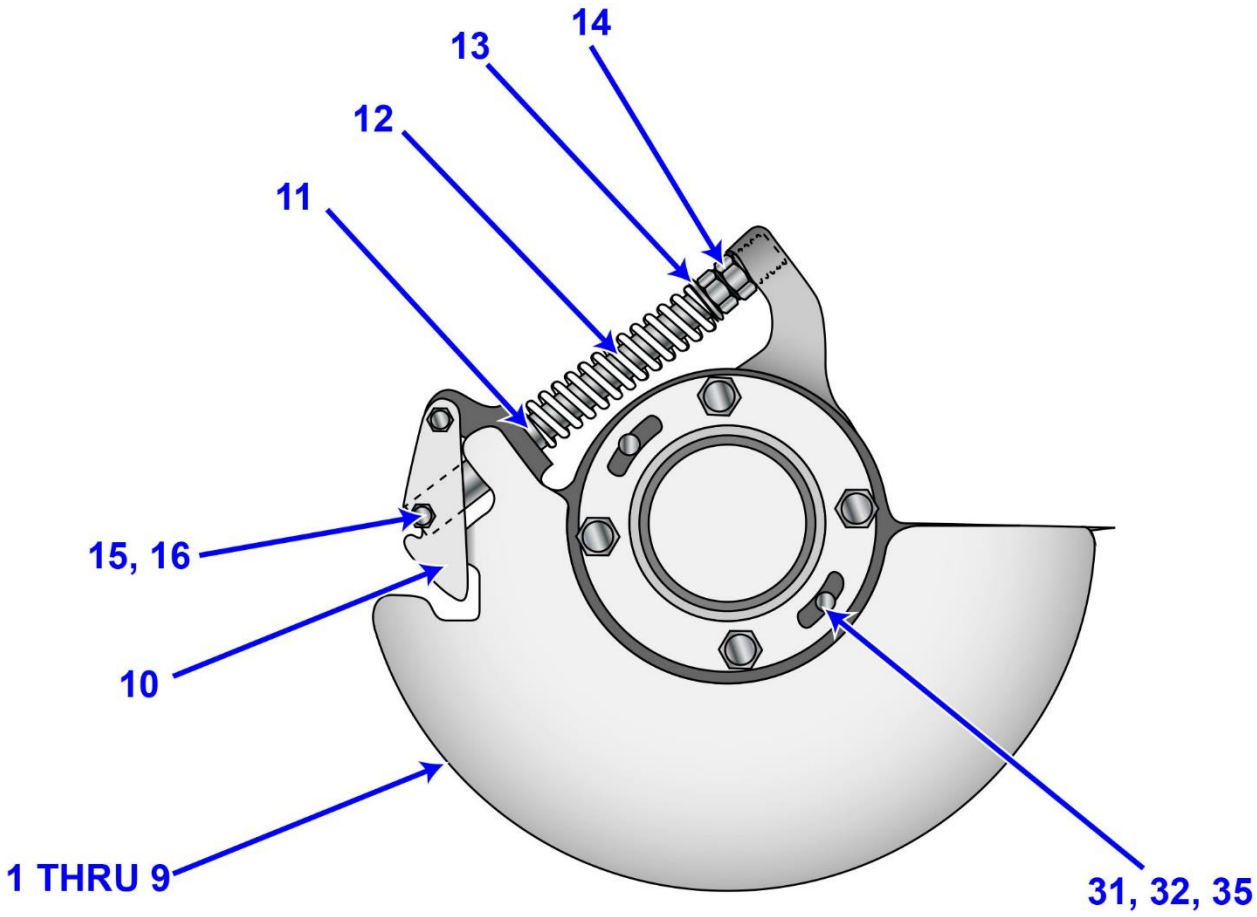


MO-0093



Adapted for testing purposes only from MAGNETROL, Installation, Maintenance, Operating Instructions for Models W126, W127, W251, W252, W291

MO-0101



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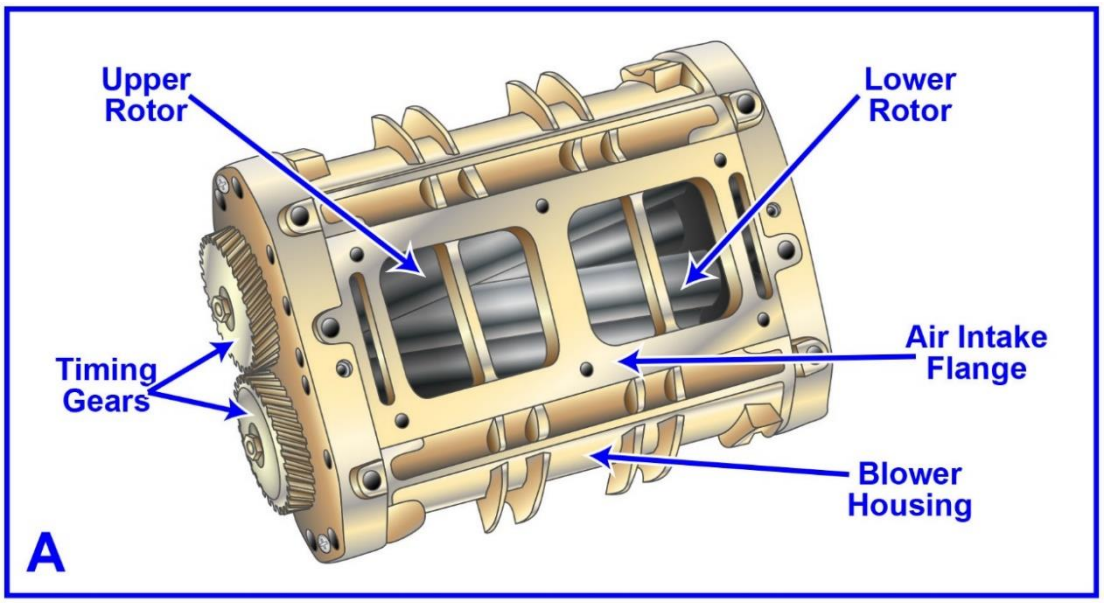
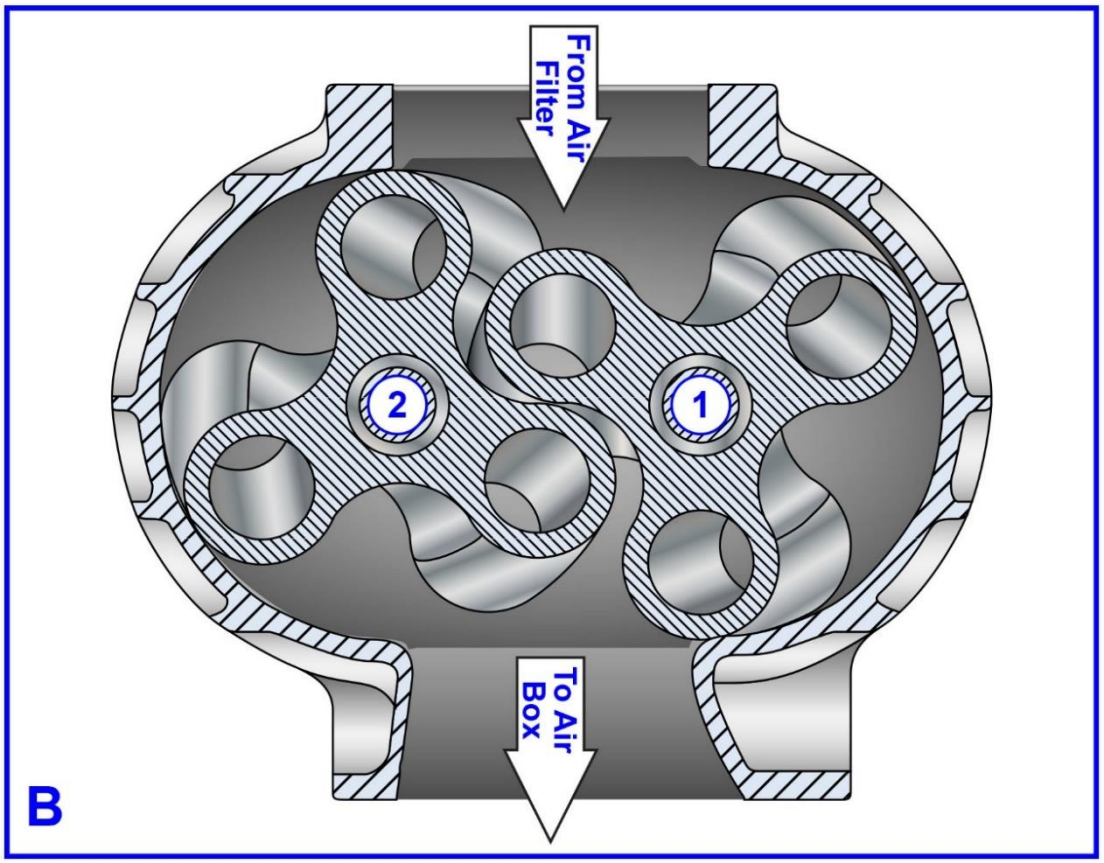
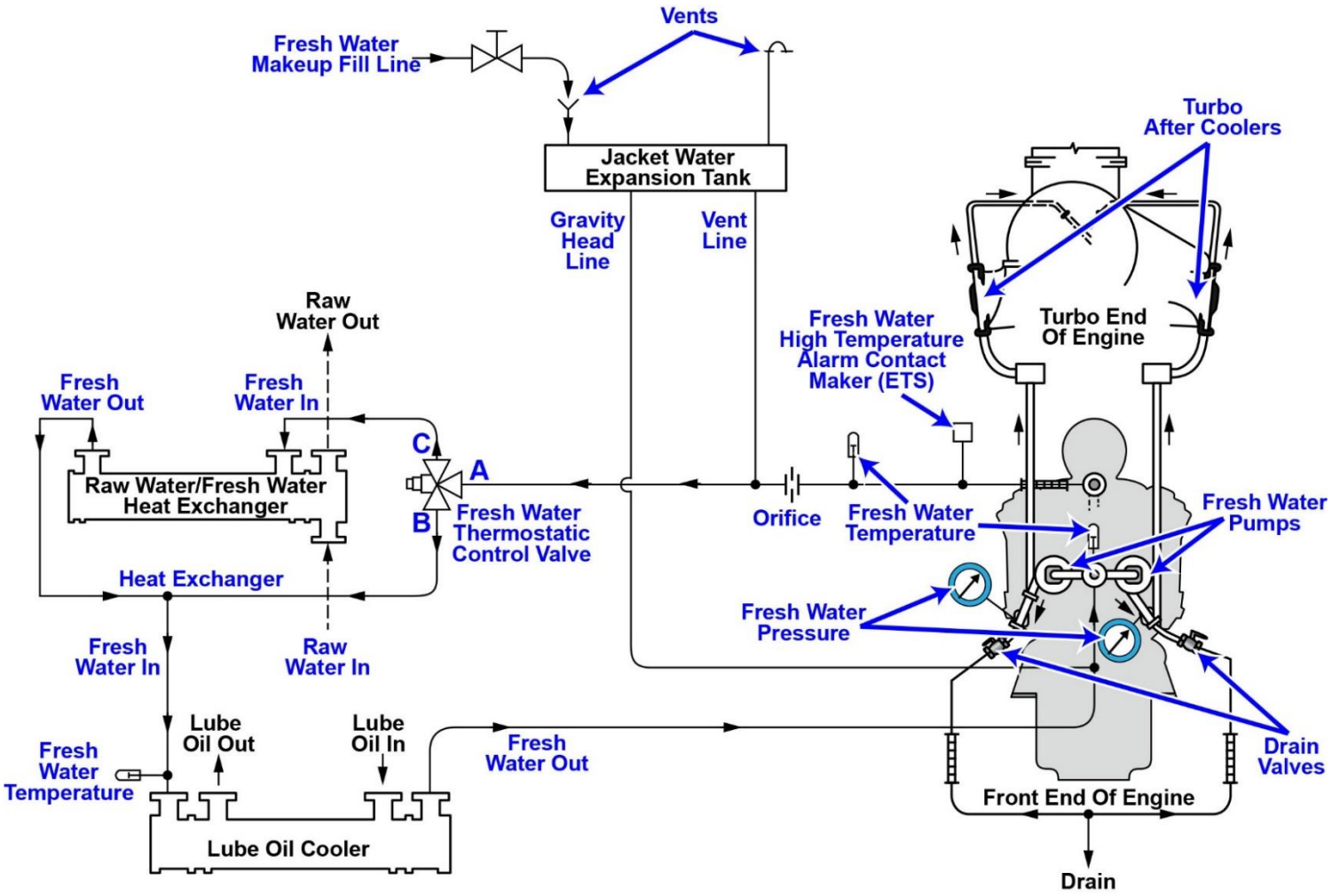
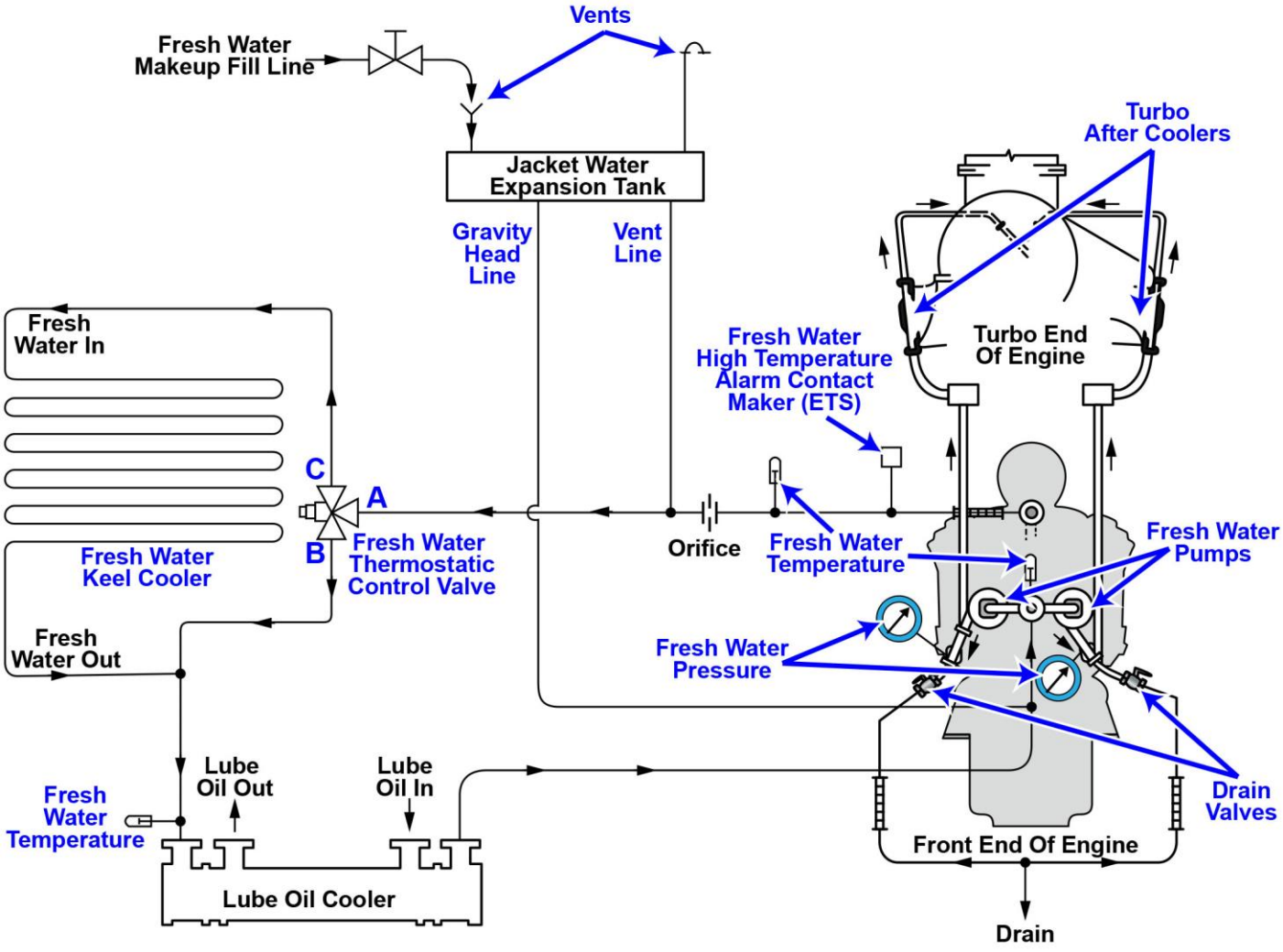




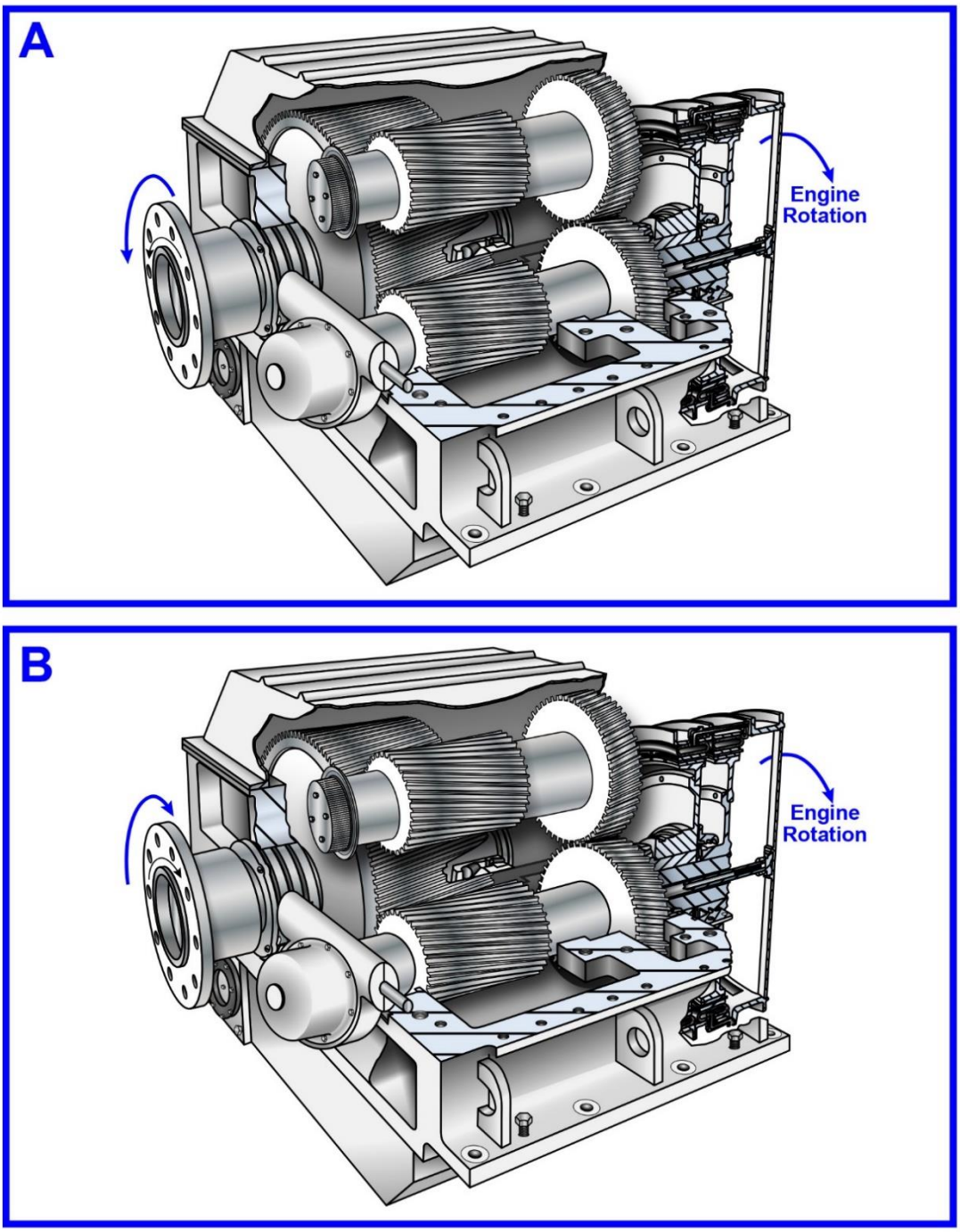
MO-0137
EMD Engine Fresh Water Cooling System with Heat Exchanger



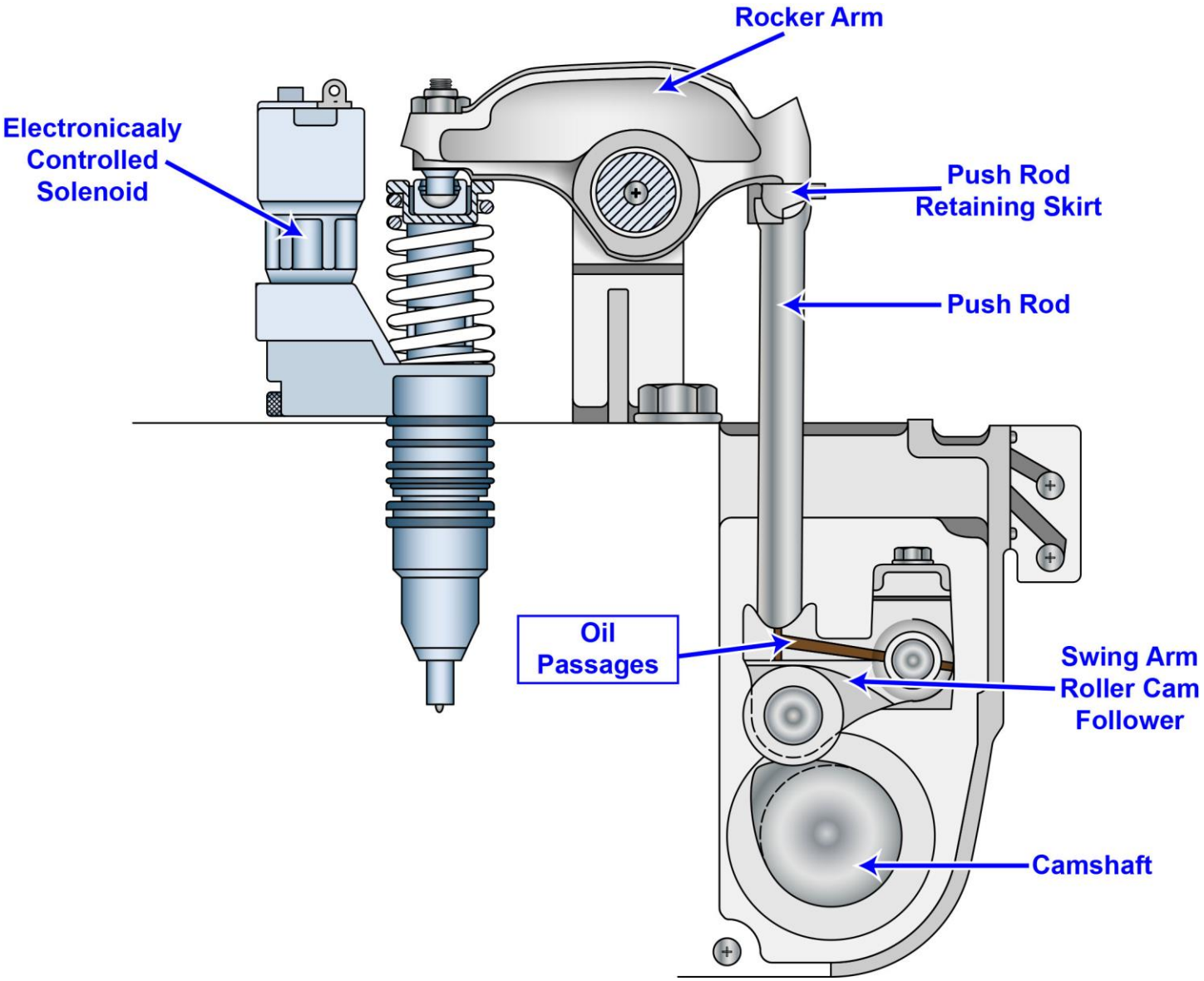
MO-0138
EMD Engine Fresh Water Cooling System with Keel Cooler



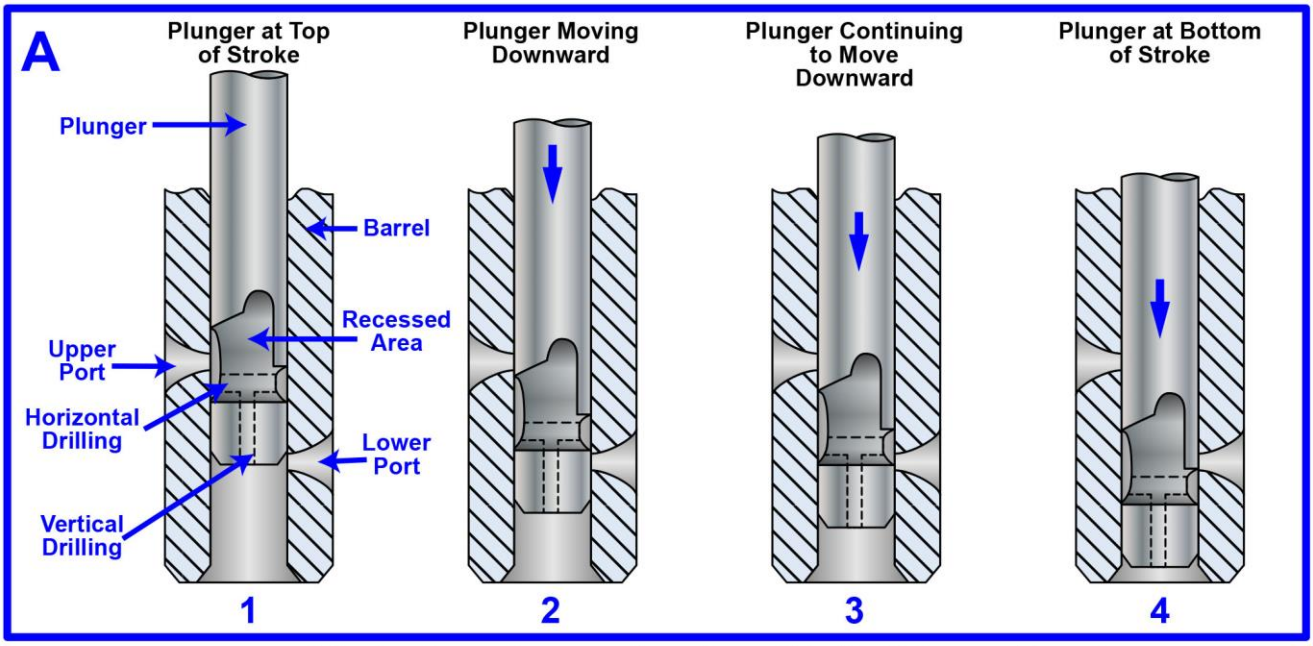
MO-0142
Reversing Reduction Gear Operation



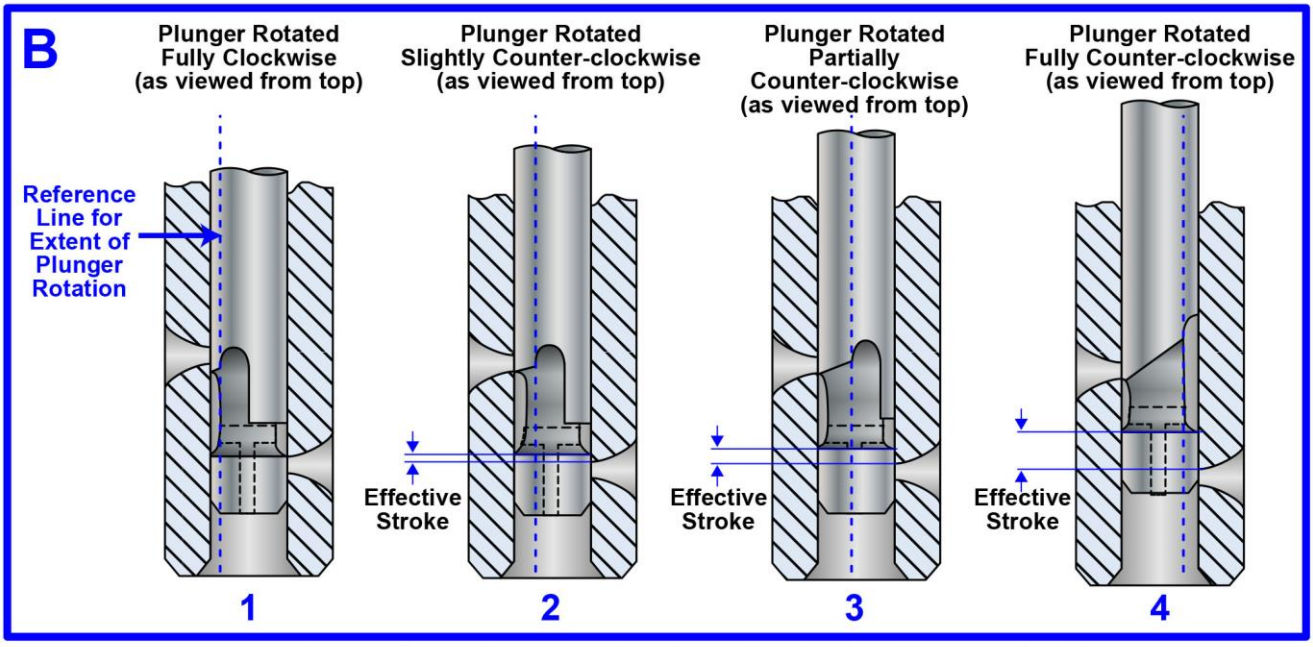
MO-0143
Detroit Diesel 60 Series Engine
Unit Injector Arrangements



MO-0144
Detroit Diesel 71 Series Engine Unit Injector

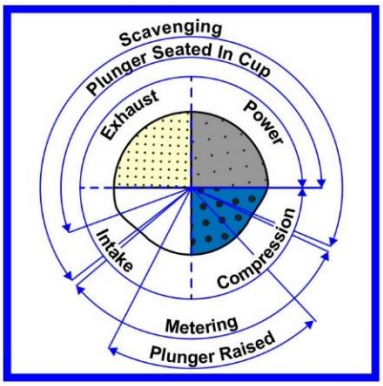


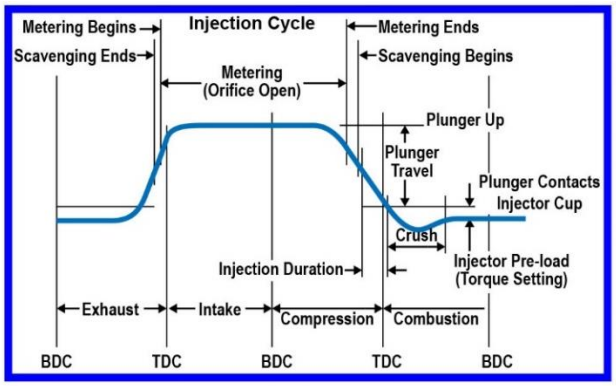
Injector Operation as a Function of Vertical Plunger Travel

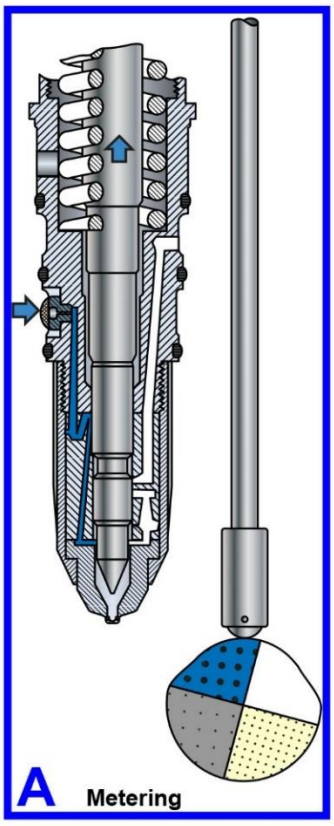


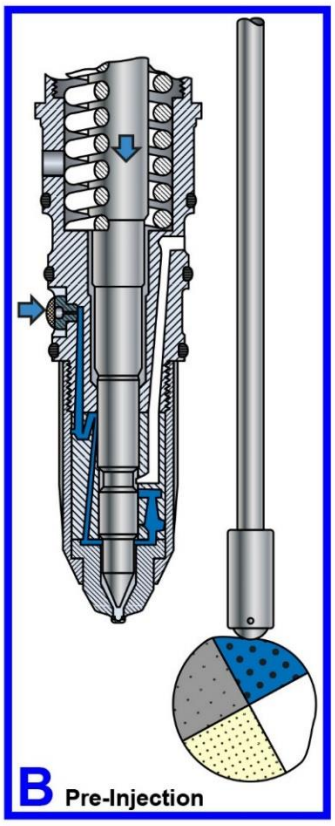
Injector Operation as a Function of Extent of Plunger Rotation

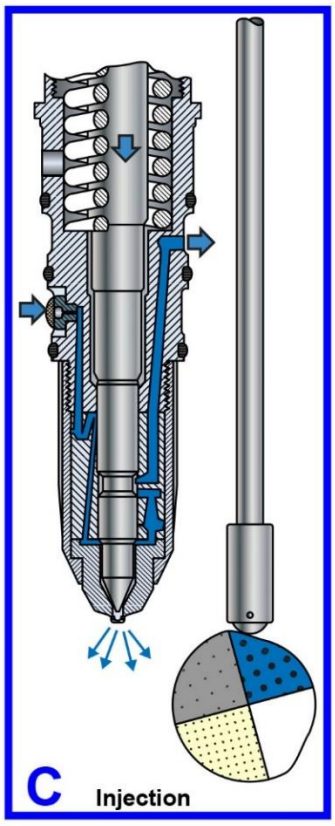
MO-0146
Cummins PT Injection System Injector

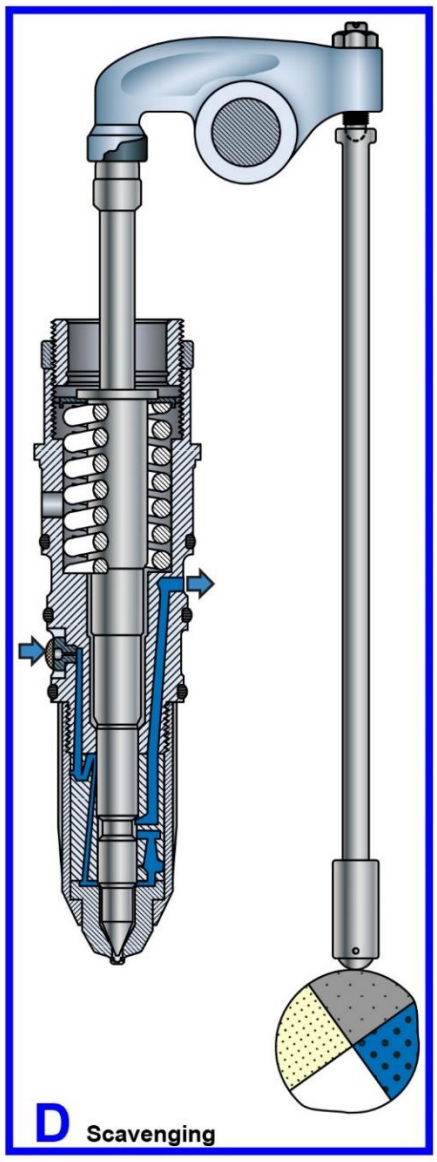












MO-0150

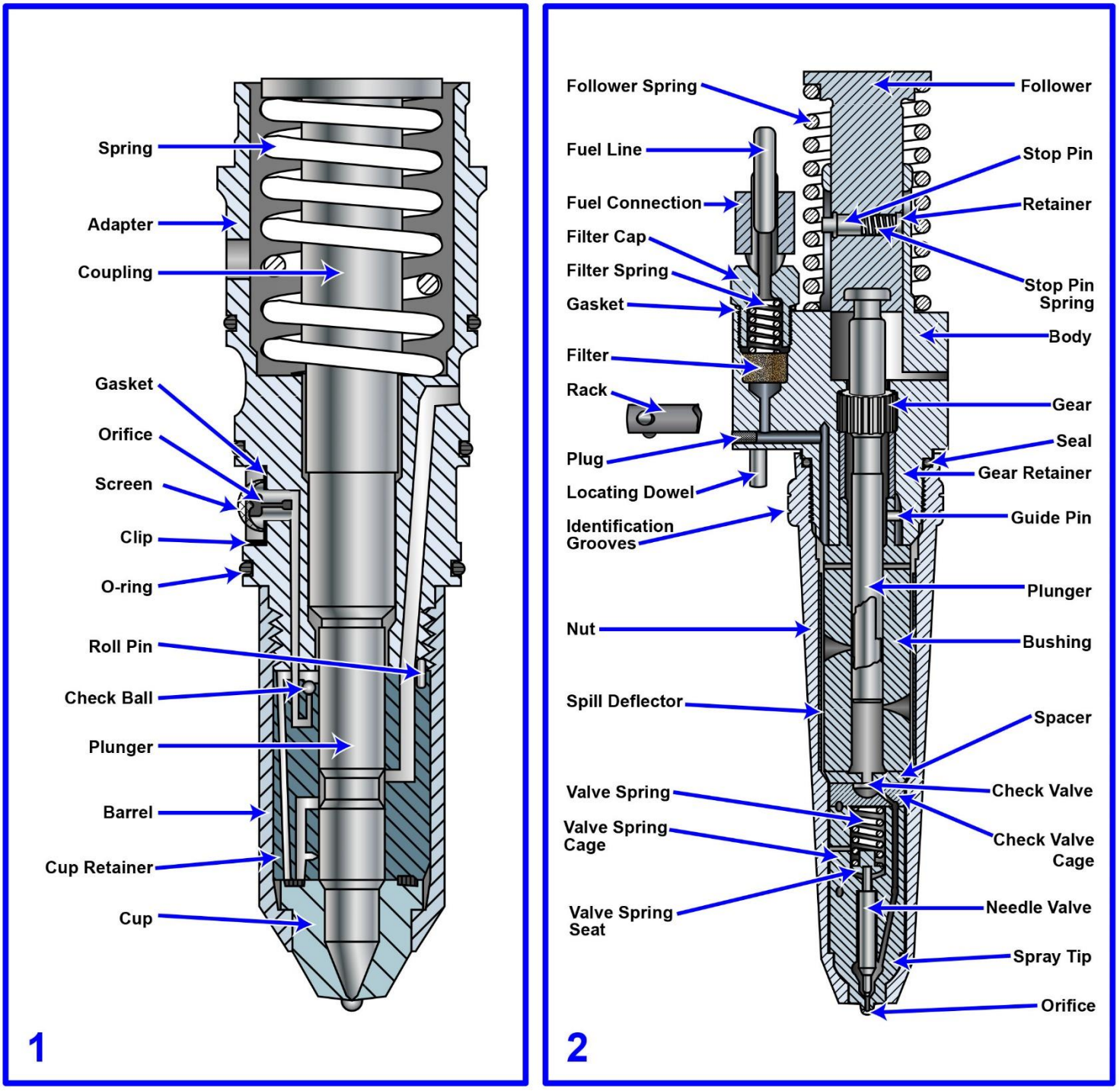
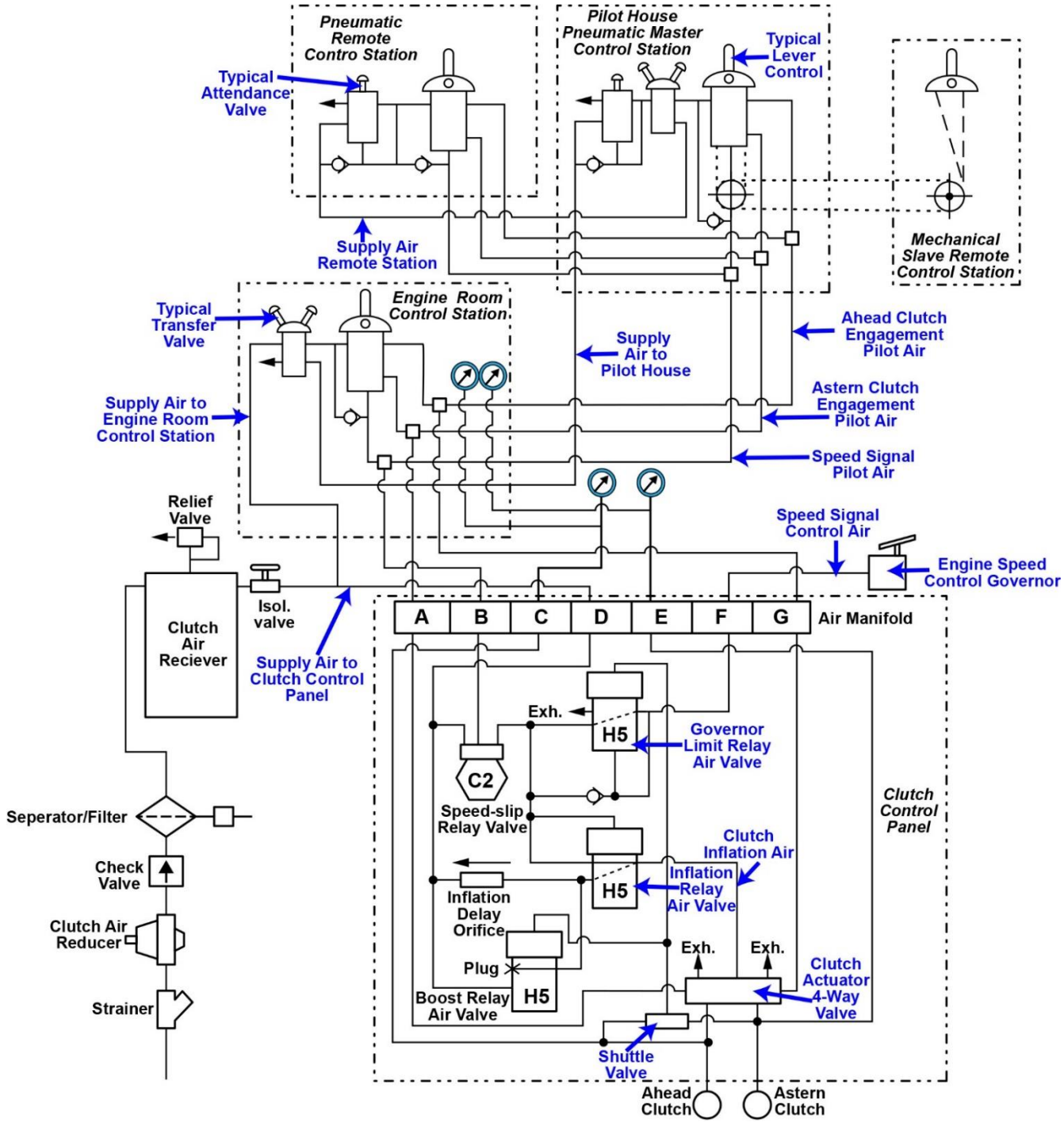


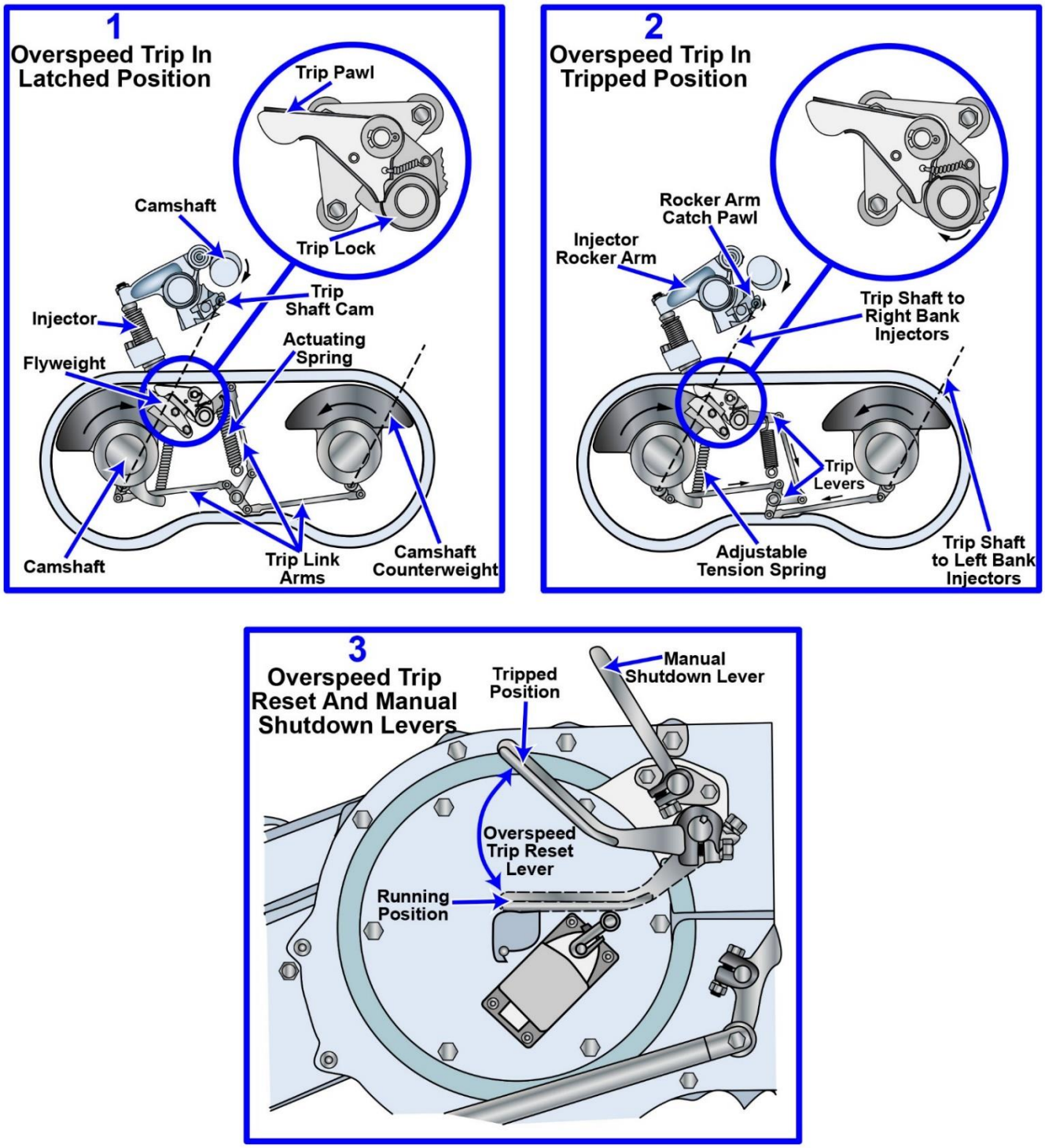
Figure 1: Adapted for testing purposes only from NORMAN, Diesel Technology: Fundamentals, Service, Repair

Figure 2: Adapted for testing purposes only from STINSON, Diesel Engineering Handbook, 12th Edition

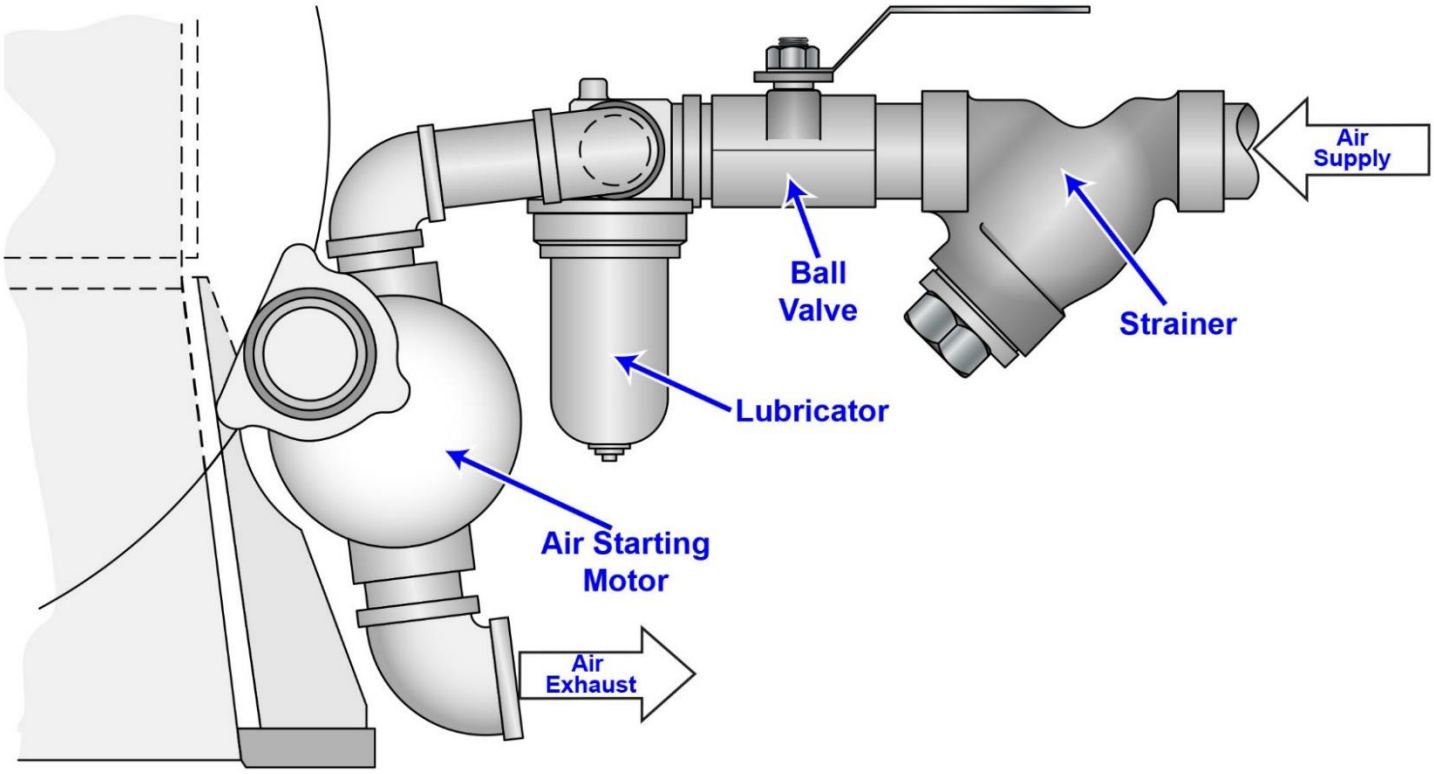
MO-0168
Pneumatic Propulsion Control System



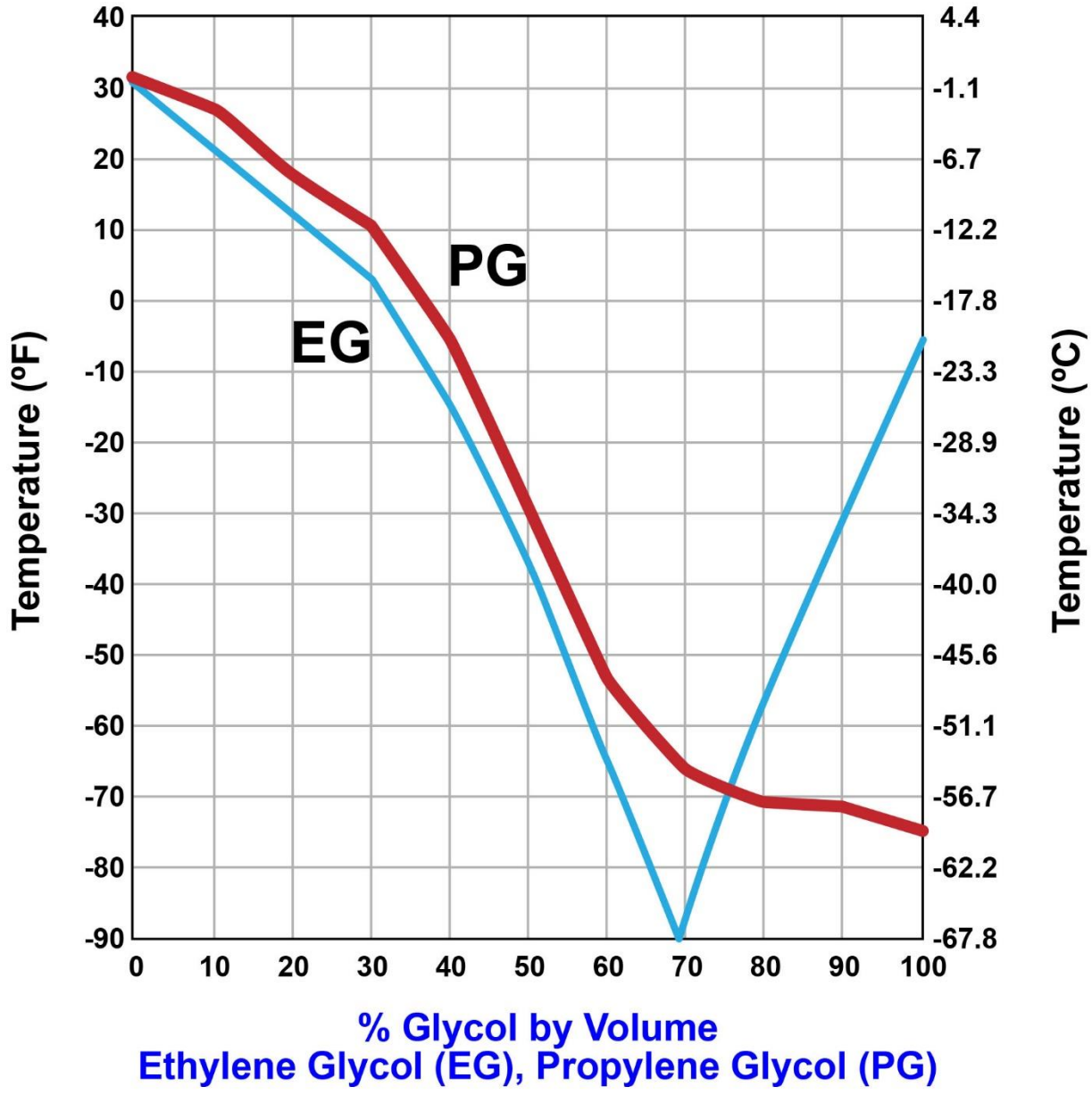
MO-0171
EMD 645 Overspeed and Manual Trips



MO-0203
Simplified Air Starting System



MO-0209
Freezing Point of Coolant as a Function of Glycol Concentration



MO-0224