U.S.C.G. Merchant Marine Exam

First Assistant Engineer

Q514 Motor Plants

(Sample Examination)

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Illustrations: 18

Choose the best answer to the following Multiple Choice Questions:

1. Regularly taken indicator cards on a slow-speed diesel engine provides relative engine performance data allowing engineers to compare to previous data and manufacturer's design. What are the two most important parameters obtained from reading the indicator cards?

- (A) Pmax and injection delay.
- (B) Pcomp and injection timing.
- (C) Pmax and scavenging air pressure.
- (D) Pmax and Pcomp.

If choice D is selected set score to 1.

2. As an engineer of a slow-speed diesel powered vessel, you note that the indicator card diagrams have a flat horizontal profile around TDC. To rectify this, what would be your best course of action?

- (A) Reduce the RPM at which the readings are taken.
- (B) Increase the RPM at which the readings are taken.
- (C) Use a spring with a lower spring constant (k value) in the indicator.
- (D) Use a spring with a higher spring constant (k value) in the indicator.

If choice D is selected set score to 1.

3. Oil accumulating in the exhaust piping or manifold of a diesel engine can be caused by _____.

- (A) collapsed hydraulic valve lifters
- (B) worn valve guides
- (C) excessive crankcase vacuum
- (D) excessive lube oil pressure

If choice B is selected set score to 1.

4. If there is a 'clicking' sound in the valve compartment of a diesel engine, the cause may be _____.

- (A) worn connecting rod bearings
- (B) a worn wrist pin
- (C) excessive valve lash
- (D) all of the above

If choice C is selected set score to 1.

5. Excessive wear at part #11, as shown in the illustration, would result in _____. Illustration MO-0027

- (A) improper timing
- (B) increased oil consumption
- (C) lost compression
- (D) low oil pressure

If choice B is selected set score to 1.

6. Worn main bearings will cause the compression ratio of a diesel engine to _____.

- (A) increase
- (B) decrease
- (C) increase on compression; decrease on expansion
- (D) remain the same

If choice B is selected set score to 1.

7. The most practical way of detecting an overload in one cylinder of an operating large, low-speed, main propulsion diesel engine is to _____.

- (A) check the cylinder exhaust temperature frequently
- (B) isolate each cylinder and inspect the injector
- (C) listen for combustion knock in that cylinder
- (D) check the cylinder exhausts for black smoke

If choice A is selected set score to 1.

8. Which of the following procedures should be carried out to permit the continued operation of a crosshead engine with a leaky aftercooler?

- (A) Nothing needs to be done due to the low heating value of heavy fuel.
- (B) Blank off the cooling water lines and run at reduced speed.
- (C) Switch to diesel fuel and run at reduced speed.
- (D) Bypass the aftercooler to operate at sea speed.

If choice B is selected set score to 1.

9. Which of the conditions listed could cause the cylinder relief valves on a large, low-speed, propulsion diesel engine to lift?

- (A) Excessive fuel injection
- (B) Very late injection timing
- (C) Plugged injector nozzles
- (D) Incorrect crankshaft clearances

If choice A is selected set score to 1.

10. In an auxiliary diesel engine, one reason for knurling the piston skirt is to _____.

- ○ (A) improve the piston seal
- ○ (B) transmit forces evenly
- ○ (C) allow for heat expansion
- • (D) improve skirt lubrication

If choice D is selected set score to 1.

11. In a four-stroke cycle diesel engine, badly worn intake valve guides can cause excessive _____.

- ○ (A) exhaust pressure
- ○ (B) exhaust temperatures
- • (C) lube oil consumption
- ○ (D) cooling water temperatures

If choice C is selected set score to 1.

12. One remedy for a high firing pressure, in addition to a high exhaust temperature in one cylinder of a diesel engine, is to _____.

- ○ (A) reduce fuel booster pump pressure
- ○ (B) retard fuel injector timing
- • (C) adjust the fuel rack
- ○ (D) increase scavenge air pressure

If choice C is selected set score to 1.

13. If the speed of the propeller is 135 RPM, the speed of the engine camshaft shown in the illustration will be _____. Illustration MO-0003

- • (A) 135 RPM
- ○ (B) 270 RPM
- ○ (C) variable depending on the camshaft gear train gear ratios
- ○ (D) variable depending on the ratio between engine rpm and propeller shaft rpm

If choice A is selected set score to 1.

14. The item labeled "T" as shown in figure 4 of the illustration is identified as the _____. Illustration MO-0025

- ○ (A) Aftercooler
- • (B) Exhaust manifold
- ○ (C) Scavenge manifold
- ○ (D) Exhaust gas turbine

If choice B is selected set score to 1.

15. Telescopic pipes which are attached to water cooled pistons of large, slow-speed, main propulsion diesel engines are designed to _____.

- (A) overcome excessive crankcase pressure
- (B) prevent excessive lube oil temperature
- (C) allow piston cooling water to efficiently enter the piston despite its reciprocating piston motion without contaminating the engine lube oil
- (D) prevent contamination of the cylinder cooling water with engine lube oil

If choice C is selected set score to 1.

16. The lower end of the piston rod, shown in the illustration, is fitted into the _____. Illustration MO-0003

- (A) crosshead guide
- (B) piston pin
- (C) crank pin
- (D) crosshead

If choice D is selected set score to 1.

17. The diesel engine shown in the illustration utilizes the type of cylinder construction identified as _____. Illustration MO-0007

- (A) a wet liner
- (B) a dry liner
- (C) integral with a removable sleeve
- (D) integral with a non-removable sleeve

If choice A is selected set score to 1.

18. In an internal combustion engine, which of the devices listed will force the compression rings to seal the compression gases in the space above the piston?

- (A) Use of bimetallic piston rings
- (B) Ring gap pre-tensioning
- (C) Thermal increase in ring-end clearance
- (D) Gas pressure acting against the back of the ring

If choice D is selected set score to 1.

19. Which construction detail is apparent in the connecting rod and piston assembly shown in the illustration? Illustration MO-0011

- (A) The piston is designed with a heat dam.
- (B) It is a fork assembly.
- (C) The piston is water cooled.
- (D) The wrist pin is free floating.

If choice A is selected set score to 1.

20. Piston cooling fins are located _____.

- (A) on top of the piston crown
- (B) underneath the piston crown
- (C) at the base of the piston skirt
- (D) inside the cylinder liner cooling water jacket

If choice B is selected set score to 1.

21. A 'Blotter test' is a test performed on the lube oil of a diesel engine which can determine _____.

- (A) a change in the oils viscosity
- (B) the flash point of the oil
- (C) the specific gravity of the oil
- (D) the TBN number of the oil

If choice A is selected set score to 1.

22. While underway, a slow-speed diesel engine lube oil sump level slowly begins to decrease. Which of the following should be checked?

- (A) The tank heating coils to ensure they are secured.
- (B) The lubricating oil cooler for leakage into the cooling system.
- (C) The piston oil scraper rings for excessive wear.
- (D) The standby lube oil pump to ensure it is not operating.

If choice B is selected set score to 1.

23. Crankcase explosions in propulsion diesel engines result from _____.

- (A) broken fuel lines spraying oil on the crankcase
- (B) the dilution of crankcase oil with particles of combustion
- (C) the splashing of lubrication oil by the crankshaft
- (D) the ignition of unburned fuel and air in the crankcase

If choice D is selected set score to 1.

24. For a given fuel, a change in the compression ratio will affect the ignition lag by which of the listed means?

- (A) A decrease in ignition lag will increase the compression ratio.
- (B) An increase in compression ratio will decrease the ignition lag.
- (C) A decrease in compression ratio will decrease the ignition lag.
- (D) An increase in compression ratio will increase the ignition lag.

If choice B is selected set score to 1.

25. Which statement about diesel engine combustion is true?

- (A) Turbulence in the cylinder causes a delay in ignition.
- (B) Maximum cylinder firing pressure is not developed until the piston passes TDC.
- (C) Combustion does not begin until the piston starts down on the power stroke.
- (D) Maximum combustion pressure is reached before TDC.

If choice B is selected set score to 1.

26. On a diesel-propelled vessel operating with constant slip, what is the effect on fuel consumption with an increase in shaft RPM?

- (A) fuel consumption varies as the cube of the shaft RPM
- (B) fuel consumption varies directly proportional to the shaft RPM
- (C) fuel consumption varies as the square of the shaft RPM
- (D) fuel consumption varies inversely with the shaft RPM

If choice A is selected set score to 1.

27. How may water be removed from the bowl of the separator as shown in the illustration? Illustration MO-0127

- (A) The separator is used to remove solids from the processed liquid; therefore the accumulation of water does not present a problem.
- (B) Water may only be removed from the bowl when the unit is secured and the bowl hood is removed.
- (C) When the unit is secured and the bowl stops rotating, the water is drained off the bottom of the bowl through orifice ports.
- (D) The water may be removed through the water drain valve or through the sludge ports during the sludge discharge cycle.

If choice D is selected set score to 1.

28. When changing over from residual to distillate fuel on a slow-speed diesel propelled vessel, you should limit the rate of temperature change of the fuel in order to prevent what operational difficulty?

- (A) Seizing and scuffing of fuel pump plungers and injector needle valves due to thermal effects on close clearance components.
- (B) Dezincification of the fuel in the mixing tank.
- (C) Carbonization in the fuel heater.
- (D) Surging/hunting of the governor due to rack sticking.

If choice A is selected set score to 1.

29. In the device shown in the illustration, the component lettered "A" is the _____. Illustration MO-0012

- (A) heavy phase discharge port
- (B) dirty oil input port
- (C) seal water input port
- (D) light phase discharge port

If choice B is selected set score to 1.

30. When tightening the lock ring "G" of the device shown in the illustration, two events are simultaneously accomplished. Which of the following statements represents these events? Illustration MO-0112

- (A) The lock ring forces the disc stack onto the spindle, providing a positive means of rotation and locating the bowl top to seal the separation chamber.
- (B) The lock ring ensures proper positioning of the disc stack and maintains a positive contact of the bowl top and bowl bottom.
- (C) When tightened, the lock ring allows for movement of the sliding piston and positions the sliding piston within the bowl bottom.
- (D) The lock ring ensures proper contact between the bowl top and the sliding bowl bottom, in addition to compressing the disc stack.

If choice C is selected set score to 1.

31. From the graph shown in the illustration, determine the size of the regulating ring required for the proper operation of the fuel oil centrifuge if the fuel oil specific gravity is 0.9 kg/dm^3 at 68°F, and the separating temperature is 158°F. Illustration MO-0113

- (A) 86 mm
- (B) 104 mm
- (C) 110 mm
- (D) 117 mm

If choice C is selected set score to 1.

32. While operating the fuel oil centrifuge shown in the illustration, the bowl fails to open for sludge ejection. The probable cause is that _____. Illustration MO-0012

- (A) the seal ring on the operating slide is defective
- (B) the operating water pressure is too high
- (C) the bowl disk set is clogged
- (D) one or more of the sludge ports is partially clogged

If choice A is selected set score to 1.

33. While operating the fuel oil centrifuge shown in the illustration, the fuel oil is being continuously ejected with the sludge and the seal water. The probable cause is the _____. Illustration MO-0012

- (A) back pressure is too low
- (B) gravity disk inside diameter is too large
- (C) gravity disk inside diameter is too small
- (D) incorrect number of disks have been placed in the disk stack

If choice B is selected set score to 1.

34. Which of the following conditions would be the most probable cause for the 'low oil temperature after preheater' LED indicators, as shown in the illustration, to be illuminated? Illustration MO-0127

- (A) Too low a temperature in day tank.
- (B) Incorrect steam control valve setting.
- (C) Improper steam trap selection.
- (D) Too high a temperature in settling tank.

If choice B is selected set score to 1.

35. Which of the following statements describes what will occur if the annular spaces, indicated by the letter "K" of the device shown in the illustration, became restricted? Illustration MO-0112

- (A) The bowl will fail to close when starting and the unit will not shoot when operating.
- (B) The unit will not start due to pressure/time delay relays.
- (C) Operating water will be supplied through port "S".
- (D) The bowl will fail to close, but the unit will be capable of shooting while in operation.

If choice A is selected set score to 1.

36. Carbon deposit build up on the injection nozzle orifice is least likely to occur when using which type of fuel injector nozzle?

- (A) Hole
- (B) Pintle
- (C) Multi-hole
- (D) Multi-pintle

If choice B is selected set score to 1.

37. Regarding the fuel injector shown in the illustration, the purpose of piece #38 is to _____. Illustration MO-0059

- (A) filter the fuel
- (B) maintain fuel pressure at a preset level
- (C) adjust the fuel rack spring tension
- (D) relieve excess fuel pressure to the suction side of the pump

If choice A is selected set score to 1.

38. The component shown in the illustration would be identified as a/an _____. Illustration MO-0097

- (A) centrifugal flyweight governor
- (B) slow-speed engine fuel pump
- (C) slow-speed engine cylinder liner lubricator
- (D) injector cooling system pump

If choice B is selected set score to 1.

39. Which of the fuel nozzles listed requires the LEAST maintenance?

- (A) Single hole
- (B) Open
- (C) Pintle
- (D) Multi-hole

If choice C is selected set score to 1.

40. Because of the close tolerances used in diesel engine fuel oil pumps, a worn plunger requires _____.

- (A) highly polishing both the plunger and barrel
- (B) replacing the plunger and the barrel
- (C) grinding the spare plunger to the barrel
- (D) replacing plunger only

If choice B is selected set score to 1.

41. While examining a used fuel injection nozzle(s), one finds worn and enlarged orifices. What does this indicate about that cylinder's performance prior to nozzle replacement(s)?

- (A) Volume of atomization is increased, penetration is reduced, vaporization is increased, and efficiency is not affected.
- (B) Reduced combustion efficiency, increased ignition delay, reduced atomization, and prolonged penetration.
- (C) Penetration is increased, air/fuel mixture is increased, and cylinder efficiency is not substantially affected.
- (D) Volume of fuel injected is increased, reduced injection pressure, decreased ignition delay.

If choice B is selected set score to 1.

42. Injection lag in a diesel engine may be caused by _____.

- (A) a change in the cetane number of the fuel
- (B) a decrease in compression pressure
- (C) the flexibility of high-pressure fuel lines
- (D) a decrease in the air temperature

If choice C is selected set score to 1.

43. Which of the following statements concerning the factors affecting ignition delay is correct?

- (A) An increase in combustion chamber turbulence will increase ignition delay.
- (B) An increase in compression ratio will increase ignition delay.
- (C) An increase in coolant temperature will decrease ignition delay.
- (D) An increase in intake air temperature will increase ignition delay.

If choice C is selected set score to 1.

44. The pneumatic circuit shown in the illustration is part of a complex large low-speed engine control system. Which of the following statements describes the function of this circuit? Illustration MO-0117

- (A) The piston labeled A provides a low-pressure signal to the other components illustrated.
- (B) Valve D, when depressed, allows the retained pneumatic pressure within the shutdown servomotor to be relieved.
- (C) The circuit shown is used to shift the camshaft position when reversing the engine.
- (D) When oil pressure to valve C is diminished, a pressure decrease is developed at valve D, causing it to shift, and nullifying the actuating signal to device A.

If choice B is selected set score to 1.

45. Which of the following statements describes the function of the device labeled "C" shown in the illustration? Illustration MO-0115

- (A) The regulator, or pressure reducer, drops the supply pressure to the desired operating level.
- (B) Constant pressure is maintained at device "B" while device "C" is used only to modify the output signal.
- (C) The regulator reduces the pressure of the supply air to provide ancillary main engine services.
- (D) The device is a relief valve with feedback to prevent excessive pressure from damaging system components.

If choice A is selected set score to 1.

46. What is the primary purpose of the pneumatic component shown in the illustration? Illustration MO-0119

- (A) If the locking handle is in any position other than 'zero', the output of the pneumatic valve will equal the input.
- (B) The indicated valve prevents transmission of transient signals to the governor speeder spring.
- (C) The valve with finite positioning is used to segregate terminal signals originated by the governor whenever the throttle is repositioned.
- (D) If the throttle is manually moved from its 'zero' position, the resulting effect will tend to override the output of the governor, and secure the air to the control circuit.

If choice D is selected set score to 1.

47. Which of the turbocharging methods listed directs the exhaust gases to the turbine at fairly uniform velocity and pressure?

- (A) Axial flow
- (B) Pulse pressure
- (C) Constant pressure
- (D) Constant velocity

If choice C is selected set score to 1.

48. Air scavenging of the cylinder shown in the illustration begins between figures _____.
Illustration MO-0025

- (A) 2 and 3
- (B) 3 and 4
- (C) 4 and 5
- (D) 5 and 6

If choice B is selected set score to 1.

49. While travelling in the tropics, the condensate draining from charge air receiver drain is flowing even though you have raised the inlet temperature to the allowable limit. What effect does excessive moisture have on the engine?

- (A) Increased moisture in the intake air will dilute the acid in the exhaust trunk.
- (B) Increased moisture will have a cleansing effect on the components in the path of the intake air.
- (C) Increased moisture will improve the combustion.
- (D) Increased moisture will promote corrosion in the combustion chamber and along the exhaust path.

If choice D is selected set score to 1.

50. The overspeed trip installed on most diesel engines will stop the engine by shutting off the _____.

- (A) water supply
- (B) fuel and/or air supply
- (C) exhaust damper
- (D) lube oil supply

If choice B is selected set score to 1.

51. A propulsion engine, using the speed control circuit shown in the illustration, fails to function at speeds lower than the low end of the critical speed range. Which of the following statements describes what should be done to correct this malfunction? Illustration MO-0114

- (A) Device 17A needs to be replaced, repaired, or reset to the setpoint coinciding with the RPM value for the low end of the critical speed range.
- (B) To increase the critical speed range of the engine, reduce the setpoint of 17A and 17B respectively, to 0.80 bar and 1.0 bar.
- (C) Both 17A and 17B need to be reset to decrease the critical speed range, although this procedure will increase the operating range of the engine.
- (D) The critical speed range will be varied as the setpoints of 17A or 17B are reset, therefore, another segment of the speed control circuit must be repaired.

If choice A is selected set score to 1.

52. The purpose of the compensating adjustment used in a diesel engine hydraulic governor is to _____.

- (A) limit engine load
- (B) increase governor promptness
- (C) compensate for low oil level
- (D) prevent governor hunting

If choice D is selected set score to 1.

53. Increasing the oil pressure acting on the power piston of the hydraulic governor shown in the illustration will _____. Illustration MO-0092

- (A) require the overspeed trip setting to be adjusted
- (B) decrease the speed droop
- (C) increase the speed droop
- (D) increase the governor output power

If choice D is selected set score to 1.

54. In the illustrated auxiliary diesel engine governor, decreasing the distance between piece 6 and piece 10 will affect the engine by _____. Illustration MO-0094

- (A) decreasing the speed
- (B) increasing the speed
- (C) increasing the speed droop setting
- (D) decreasing the overspeed trip setting

If choice B is selected set score to 1.

55. Adjustments to the compensating needle valve in a hydraulic governor should be made with the engine at _____.

- (A) normal operating temperature without a load
- (B) half-speed and normal temperature
- (C) maximum power at a normal load
- (D) maximum power and load under normal conditions

If choice A is selected set score to 1.

56. If the compensating needle valve of a hydraulic governor is opened more than necessary the governor will _____.

- (A) produce excessive speed response to a load change
- (B) have a larger than normal deadband
- (C) respond slowly to any change in engine load
- (D) stabilize engine speed at the new governor setting

If choice A is selected set score to 1.

57. If the speeder spring of a main propulsion diesel engine governor breaks while operating at full load, the engine RPM will _____.

- (A) remain the same until manually changed
- (B) decrease to a slightly lower value
- (C) increase until the overspeed trip is actuated
- (D) hunt until stabilized by the droop rod

If choice B is selected set score to 1.

58. The gauge glass on a coil-type auxiliary boiler is connected to the _____.

- (A) accumulator
- (B) water softener
- (C) heating coil inlet and outlet
- (D) surge chamber

If choice A is selected set score to 1.

59. Why should the main steam stop valve of an auxiliary boiler be eased off its seat and then gently closed before lighting off?

- (A) To ensure that the valve will not be seized shut when hot.
- (B) To check the valve packing.
- (C) To check for a tight bonnet seal.
- (D) To examine the valve stem for scars or nicks.

If choice A is selected set score to 1.

60. In the water level electrode assembly, shown in the illustration, the feed pump should restart when the level of the water reaches the position indicated by arrow '____'. Illustration MO-0047

- ○ (A) E
- ○ (B) B
- • (C) C
- ○ (D) D

If choice C is selected set score to 1.

61. An exhaust gas bypass is installed on a waste heat boiler in order to _____.

- • (A) minimize moisture condensation in the boiler gas passages at low loads
- ○ (B) bypass a portion of the exhaust gas at peak loads for better efficiency
- ○ (C) bypass exhaust gas at high loads to prevent excessive back pressure
- ○ (D) recycle exhaust gas to the turbocharger

If choice A is selected set score to 1.

62. With which of the following types of diesel engine arrangements is a waste heat boiler most likely to produce the maximum steam pressure, temperature, and flow conditions?

- • (A) Supercharged, four-stroke cycle diesel engine
- ○ (B) Supercharged, loop scavenged diesel engine
- ○ (C) Turbocharged, cross flow scavenged diesel engine
- ○ (D) Turbocharged, return flow diesel engine

If choice A is selected set score to 1.

63. The primary function of a flame safeguard system, as used on an automatically fired auxiliary boiler, is to prevent _____.

- ○ (A) accidental dry firing and overpressure
- ○ (B) uncontrolled fires in the furnace
- • (C) explosions in the boiler furnace
- ○ (D) overheating of the pressure parts

If choice C is selected set score to 1.

64. During unsafe firing conditions in a large automatic auxiliary boiler, various control actuators are interlocked with the burner circuit to prevent start-up, in addition to safety shutdown. These controls are referred to as _____.

- • (A) limit controls
- ○ (B) flame safeguard controls
- ○ (C) combustion controls
- ○ (D) programming controls

If choice A is selected set score to 1.

65. A variable capacity, pressure atomizing, fuel oil burner functions to _____.

- (A) maintain a constant fuel temperature
- (B) provide a wide range of combustion
- (C) provide a constant fuel return pressure
- (D) maintain smokeless fuel oil atomization

If choice B is selected set score to 1.

66. A safety valve on an auxiliary boiler simmers constantly and cannot be stopped by several quick blow-offs using the hand relieving gear. The problem may be _____.

- (A) loose dirt on the seat
- (B) exposed valve springs
- (C) a clogged drain line
- (D) a damaged seat

If choice D is selected set score to 1.

67. A burner producing black smoke in an automatic auxiliary boiler, would be caused by a/an _____.

- (A) incorrect electrode setting
- (B) defective solenoid valve
- (C) grounded high tension lead
- (D) incorrect primary air setting

If choice D is selected set score to 1.

68. In the event of a crankcase rich oil mist to air mixture explosion, where the doors are blown off the engine, which of the following may occur after the initial explosion?

- (A) The engine will overspeed.
- (B) A secondary explosion as air is drawn back into the crankcase.
- (C) The crankcase pressure will remain higher than normal.
- (D) Any crankcase fire will be self-extinguished.

If choice B is selected set score to 1.

69. If a scavenging air space fire occurs on a slow-speed diesel engine and the engine is stopped, which of the following should be done to prevent distortion due to heat?

- (A) Engage and turn the engine with the jacking gear.
- (B) Open the engine to inspect the hot area.
- (C) Let the fire burn out naturally.
- (D) Use CO_2 to extinguish the fire and cool the engine.

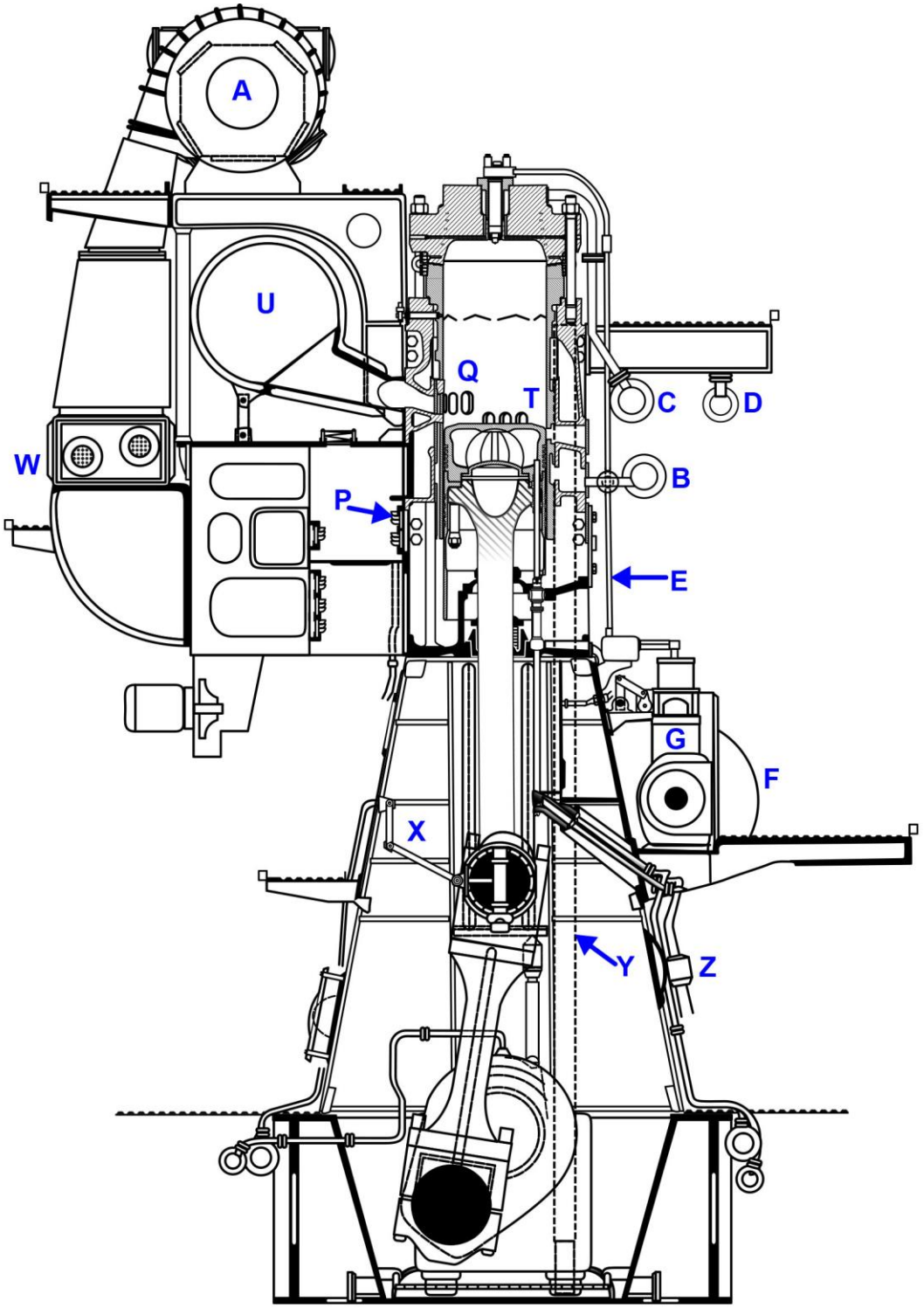
If choice A is selected set score to 1.

70. In accordance with 46 CFR Subchapter F, steel tubing connections and fittings used with diesel fuel oil systems are to be either flared or _____.

- (A) of the flareless nonbite type
- (B) silver soldered
- (C) have welded flanges
- (D) have seal-welded threads

If choice A is selected set score to 1.

MO-0003



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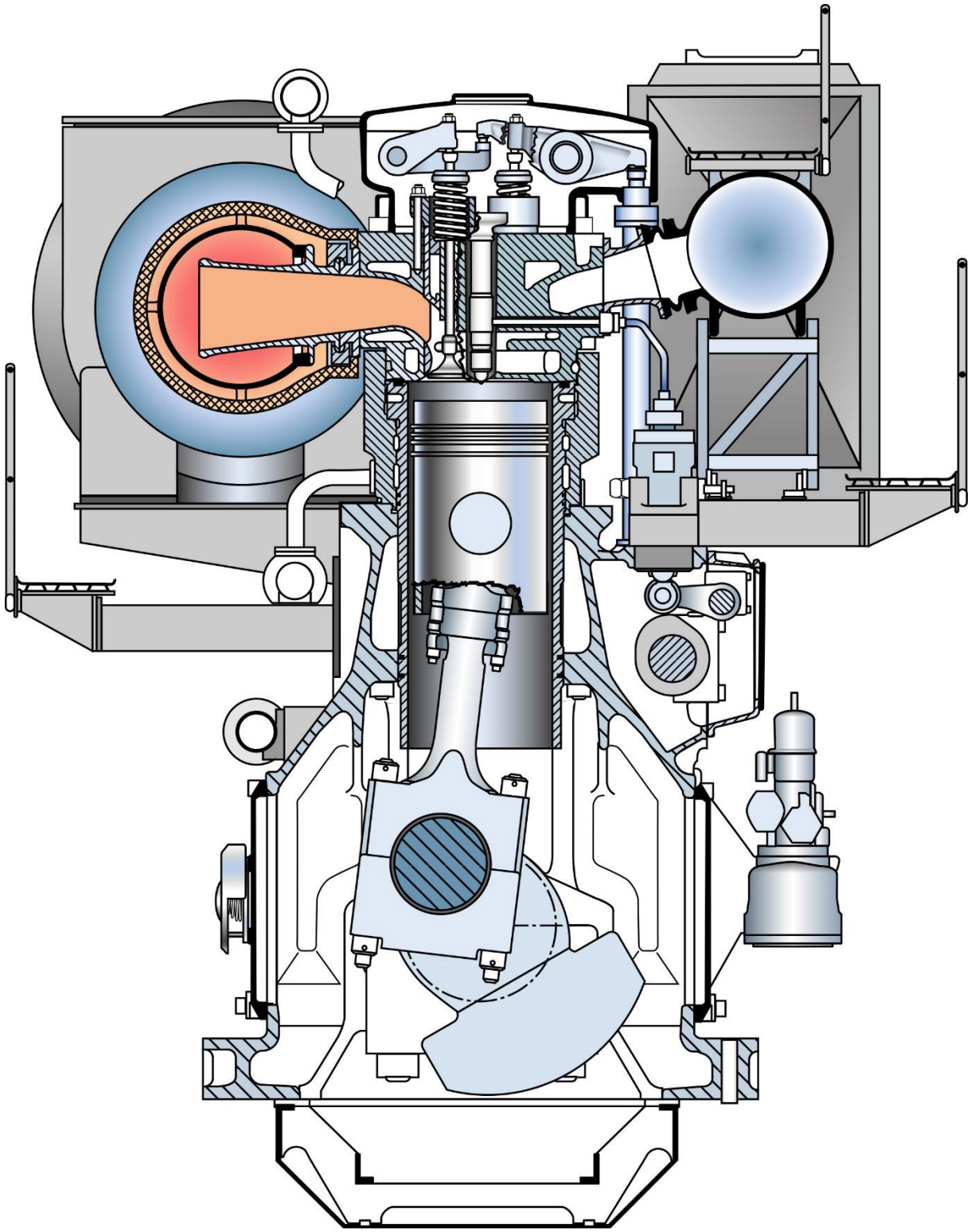

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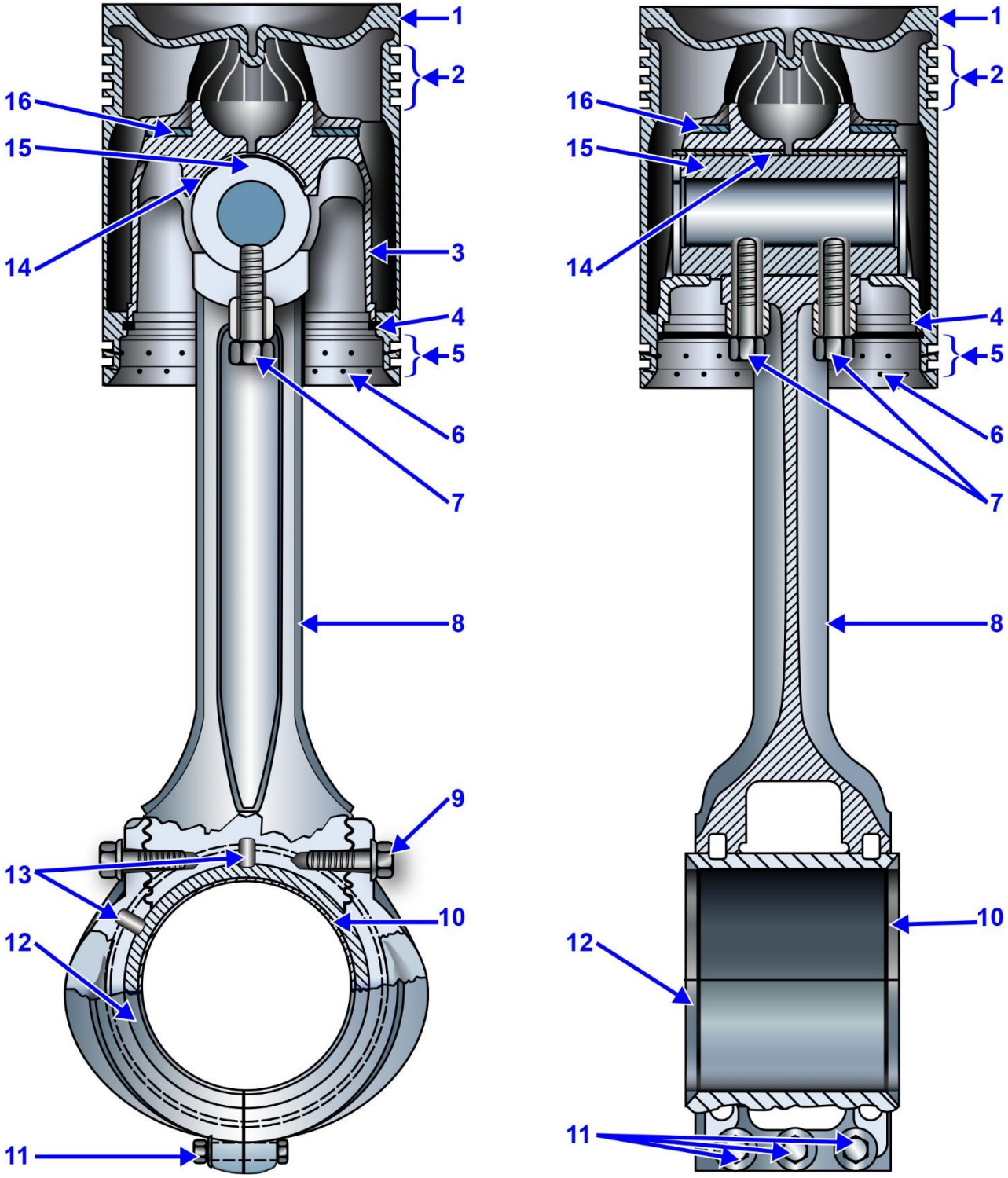

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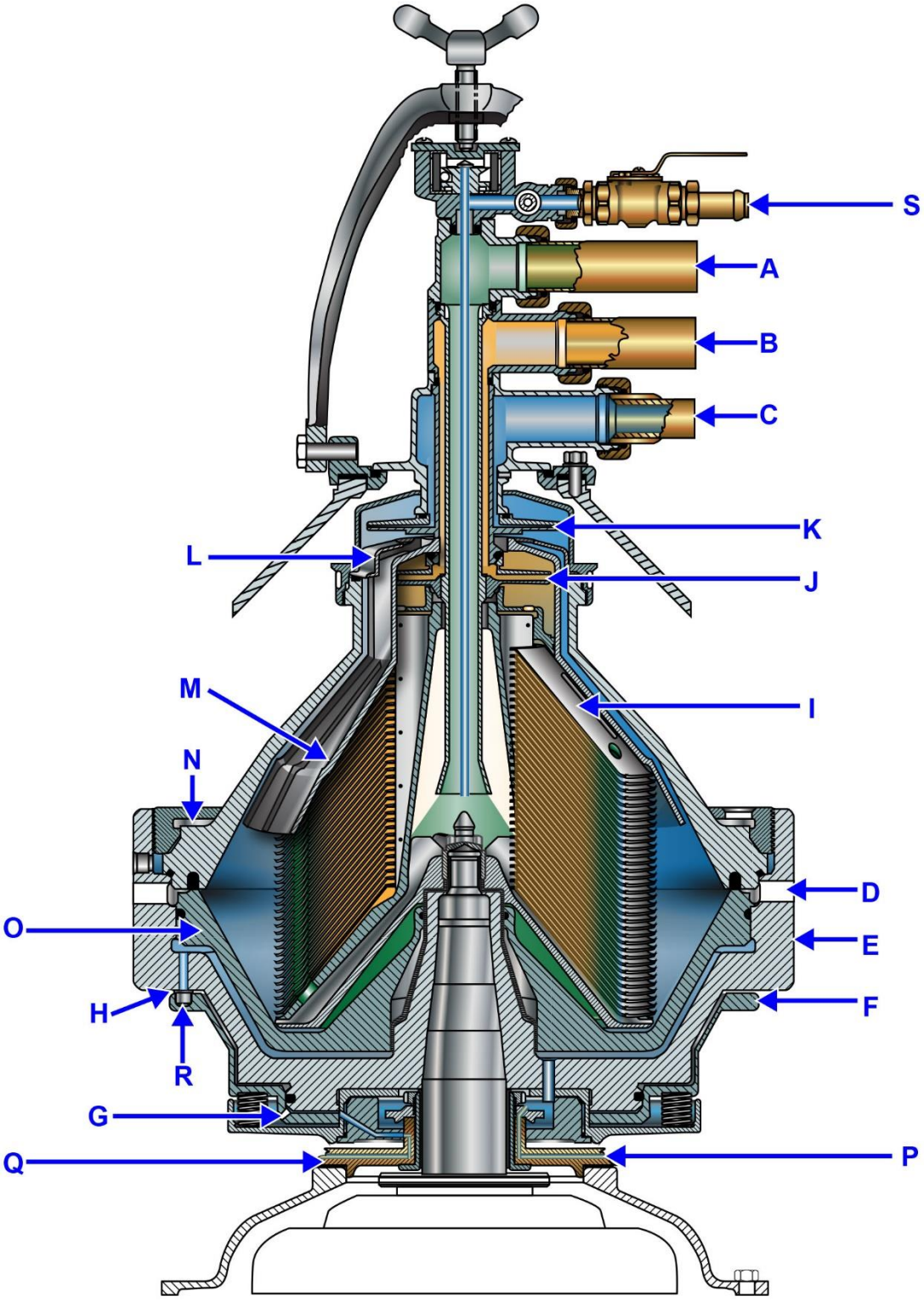

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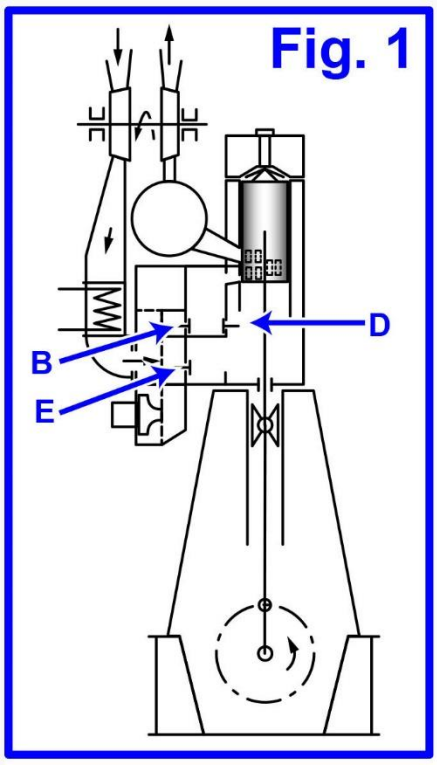
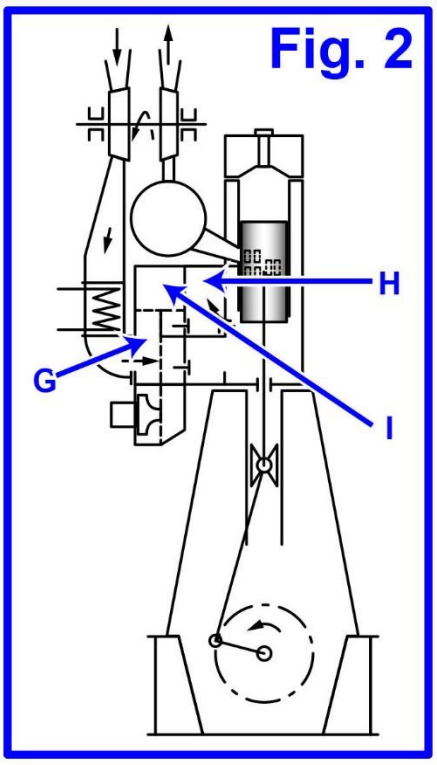
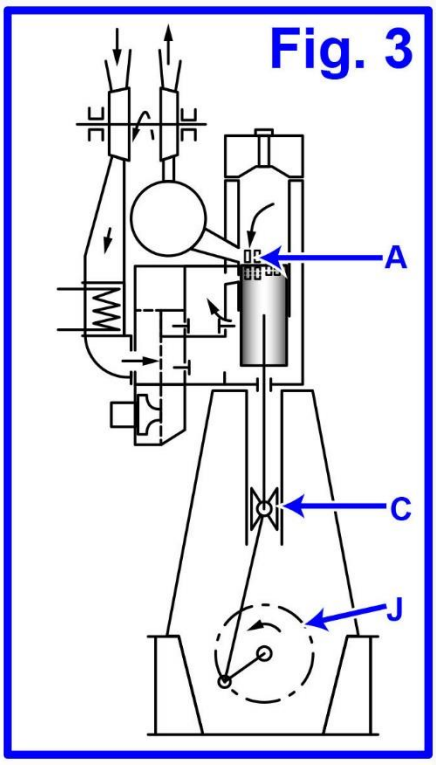
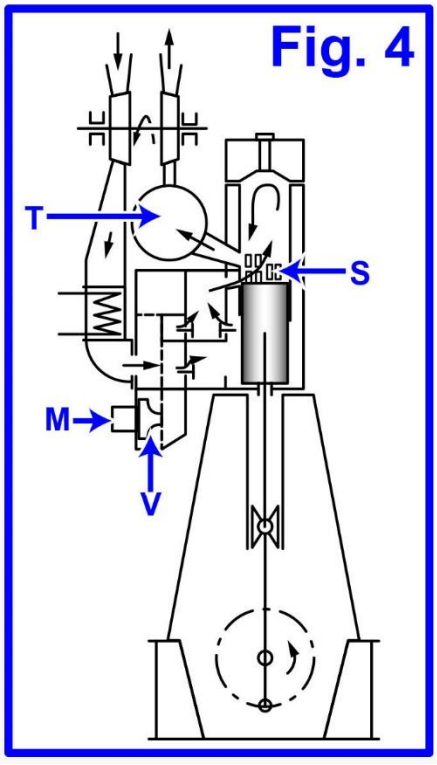
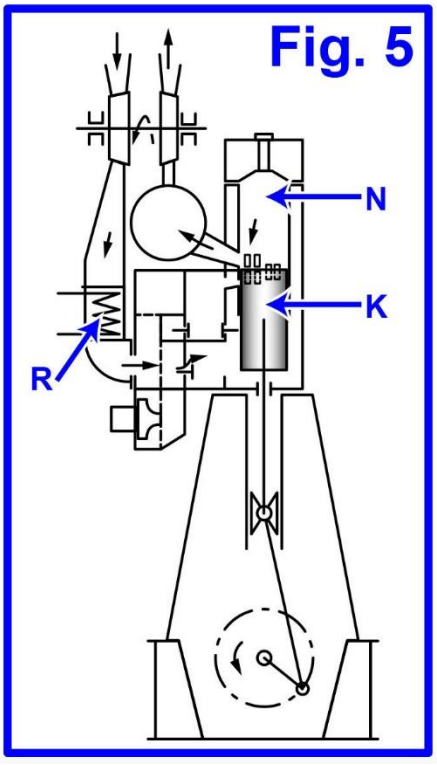
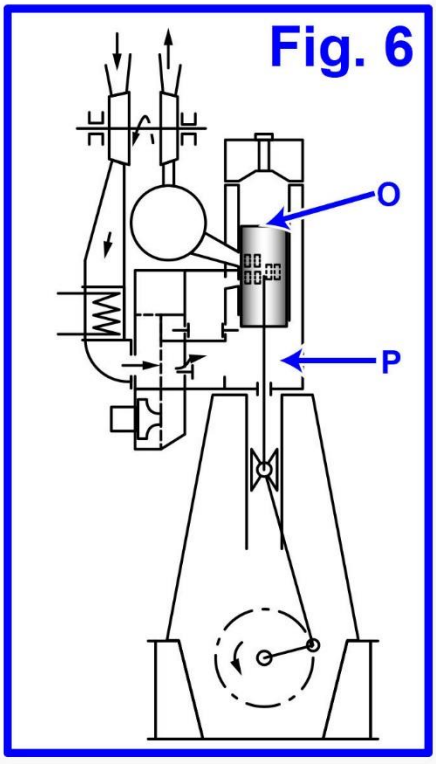




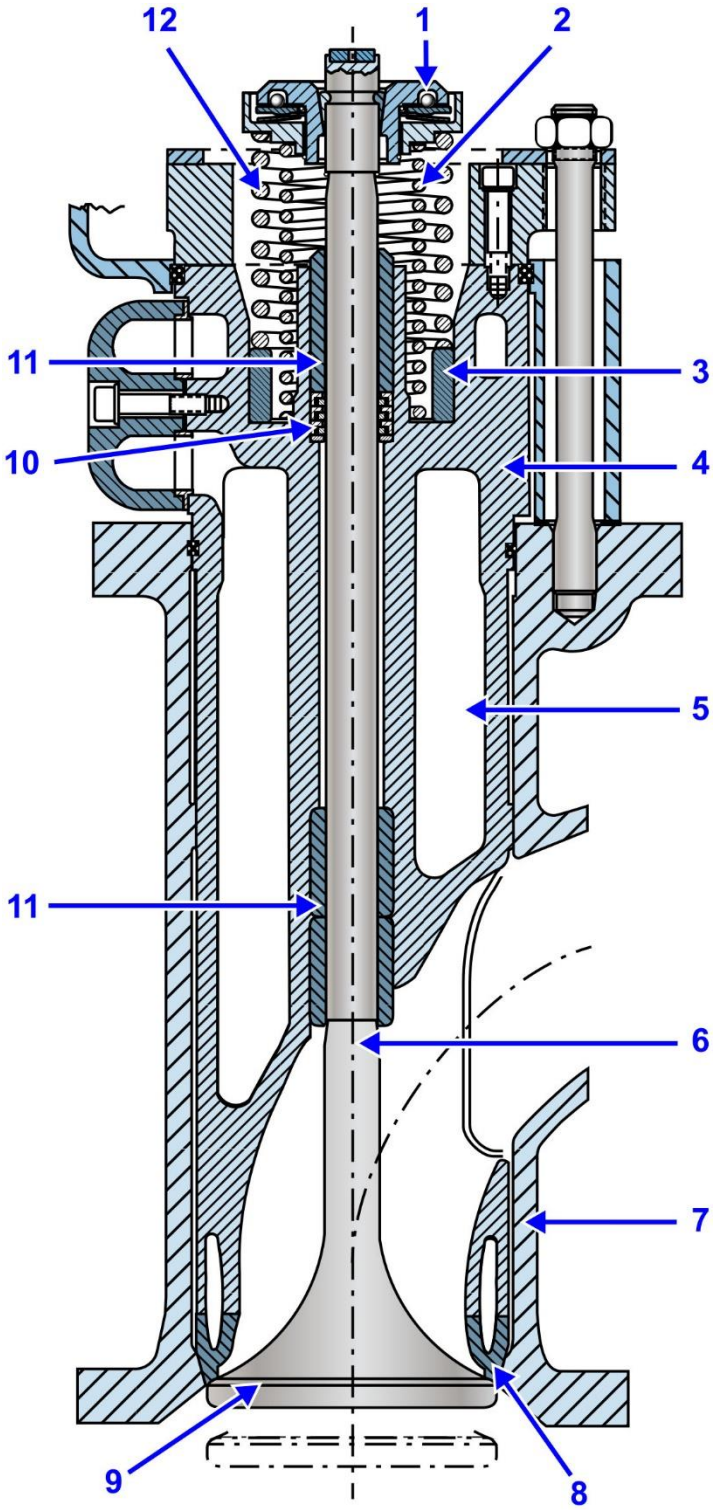








MO-0027



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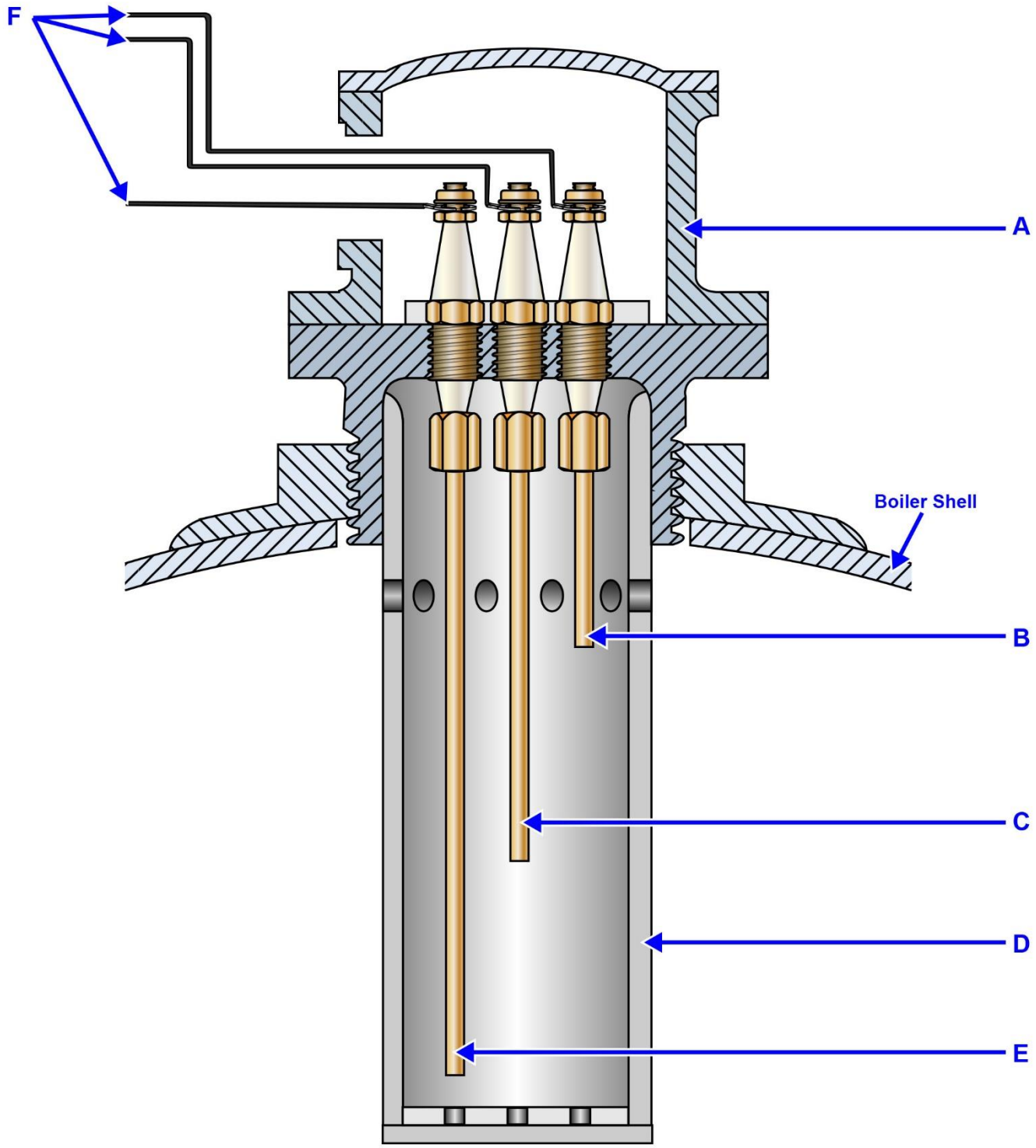

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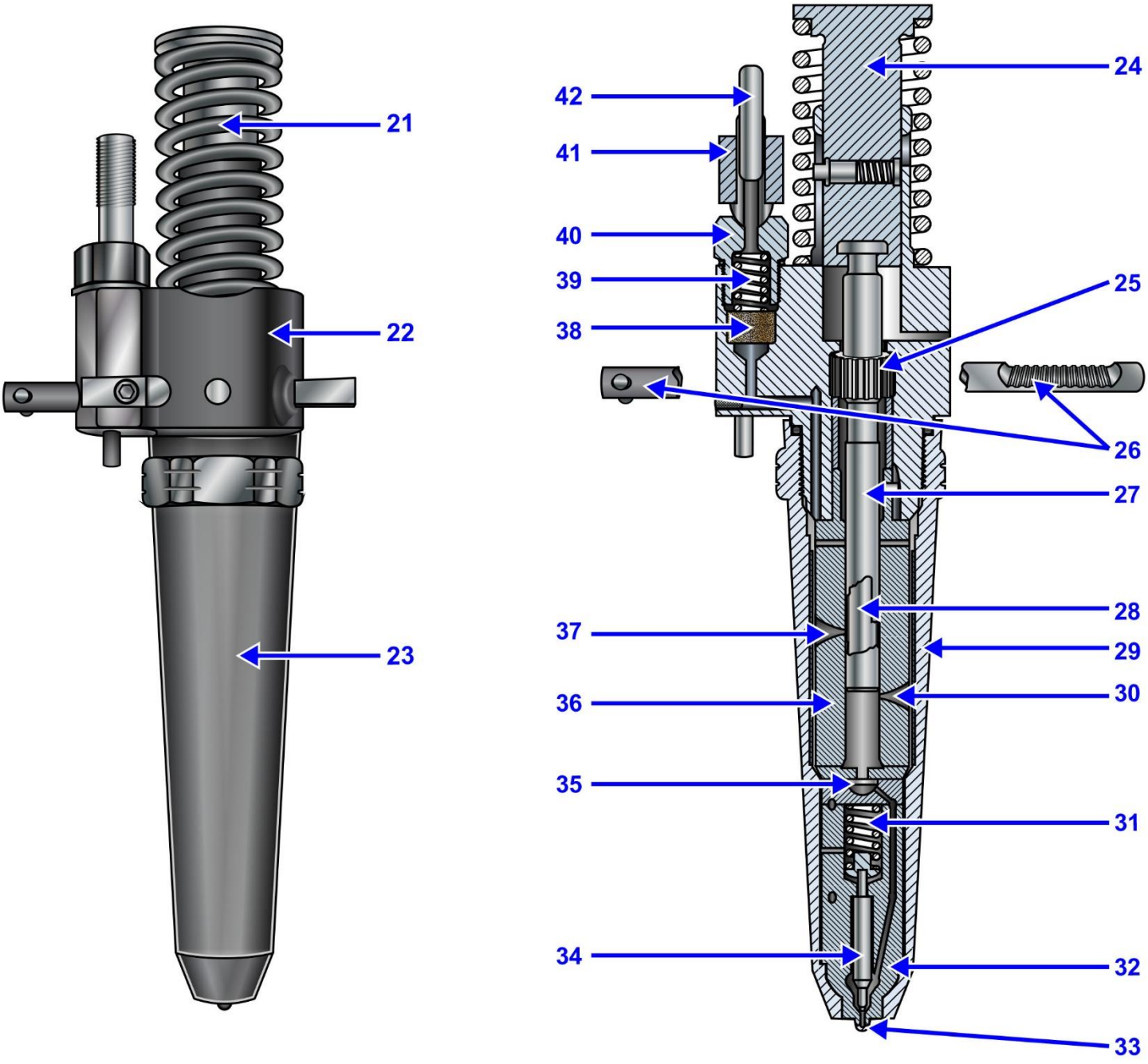

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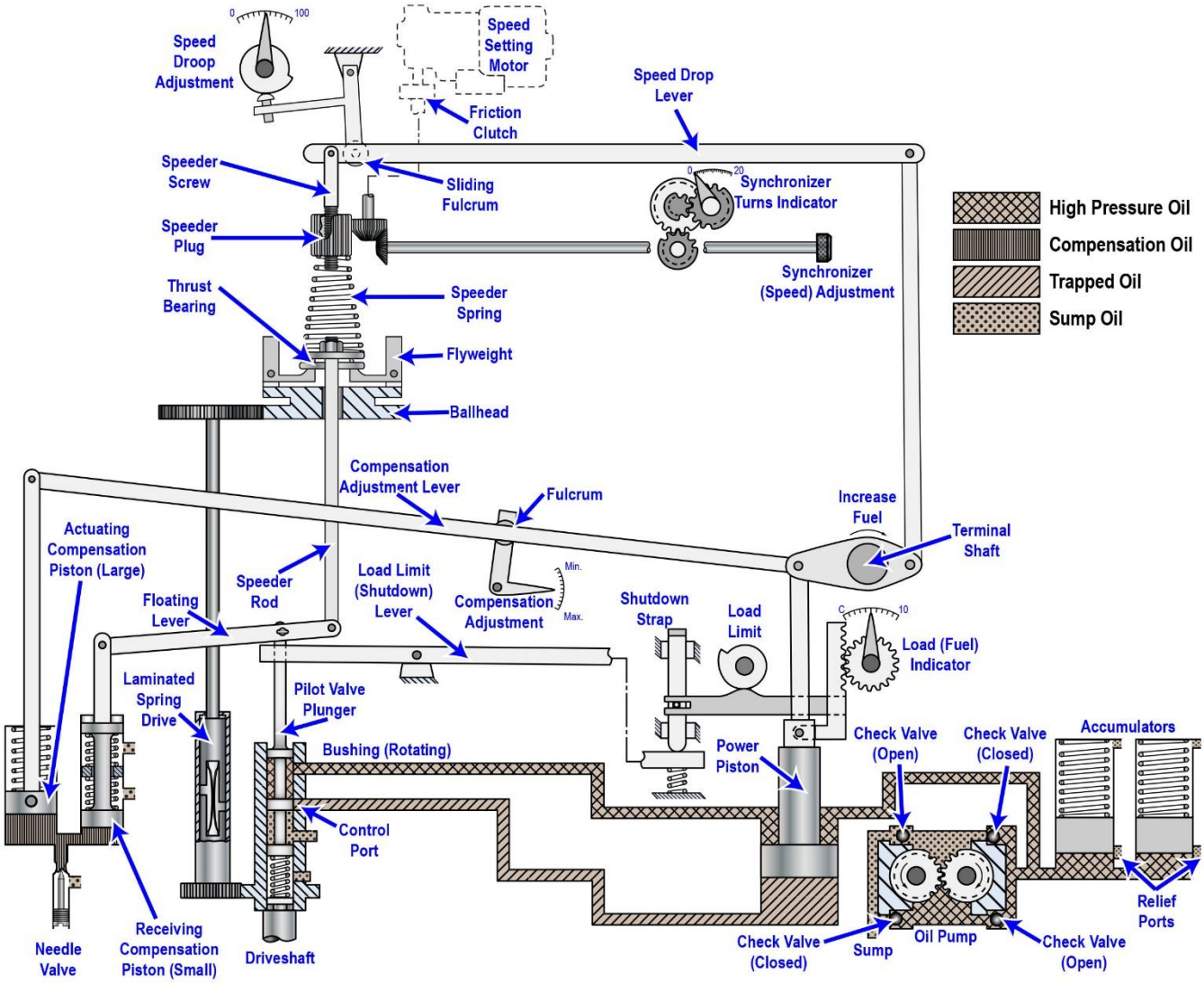

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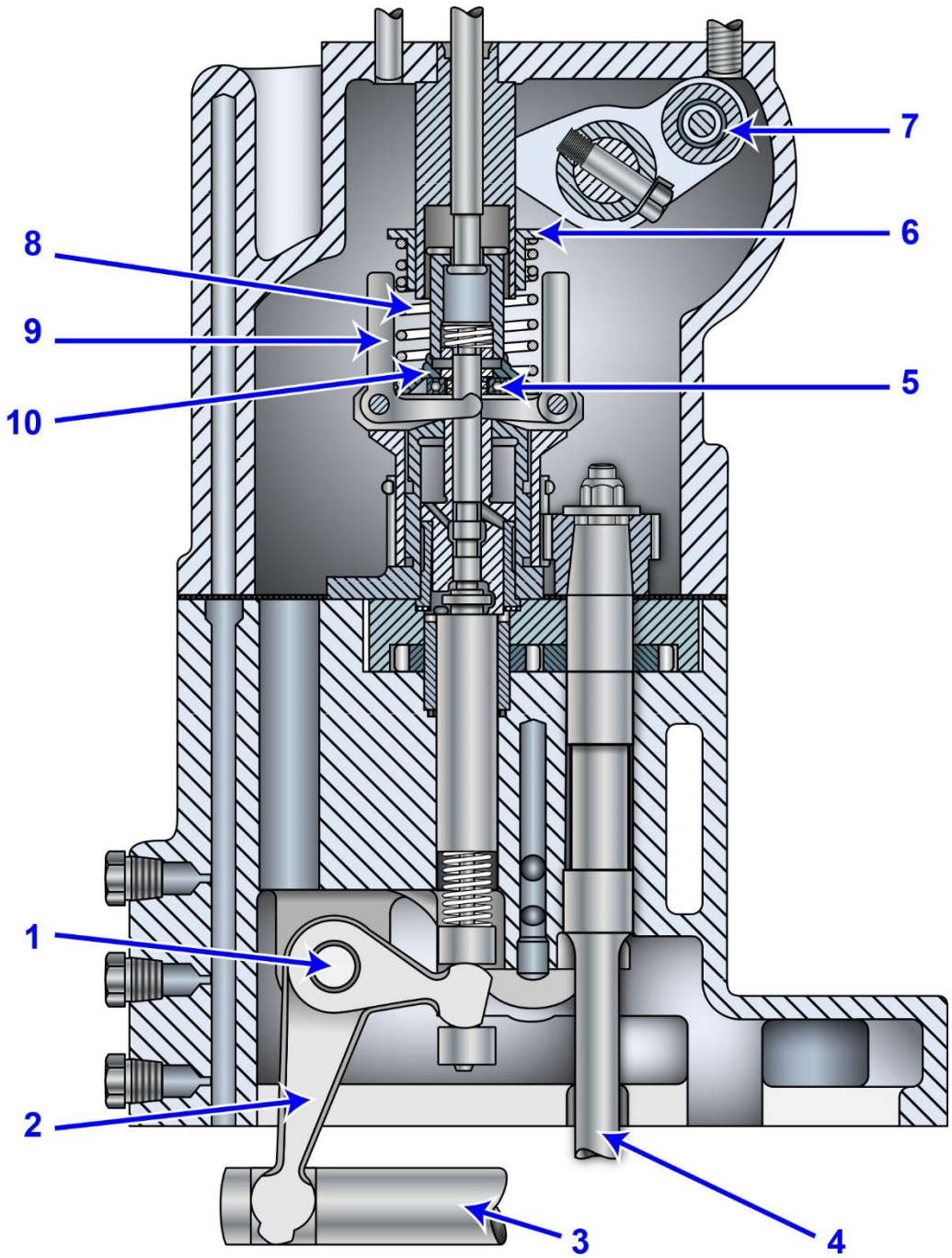

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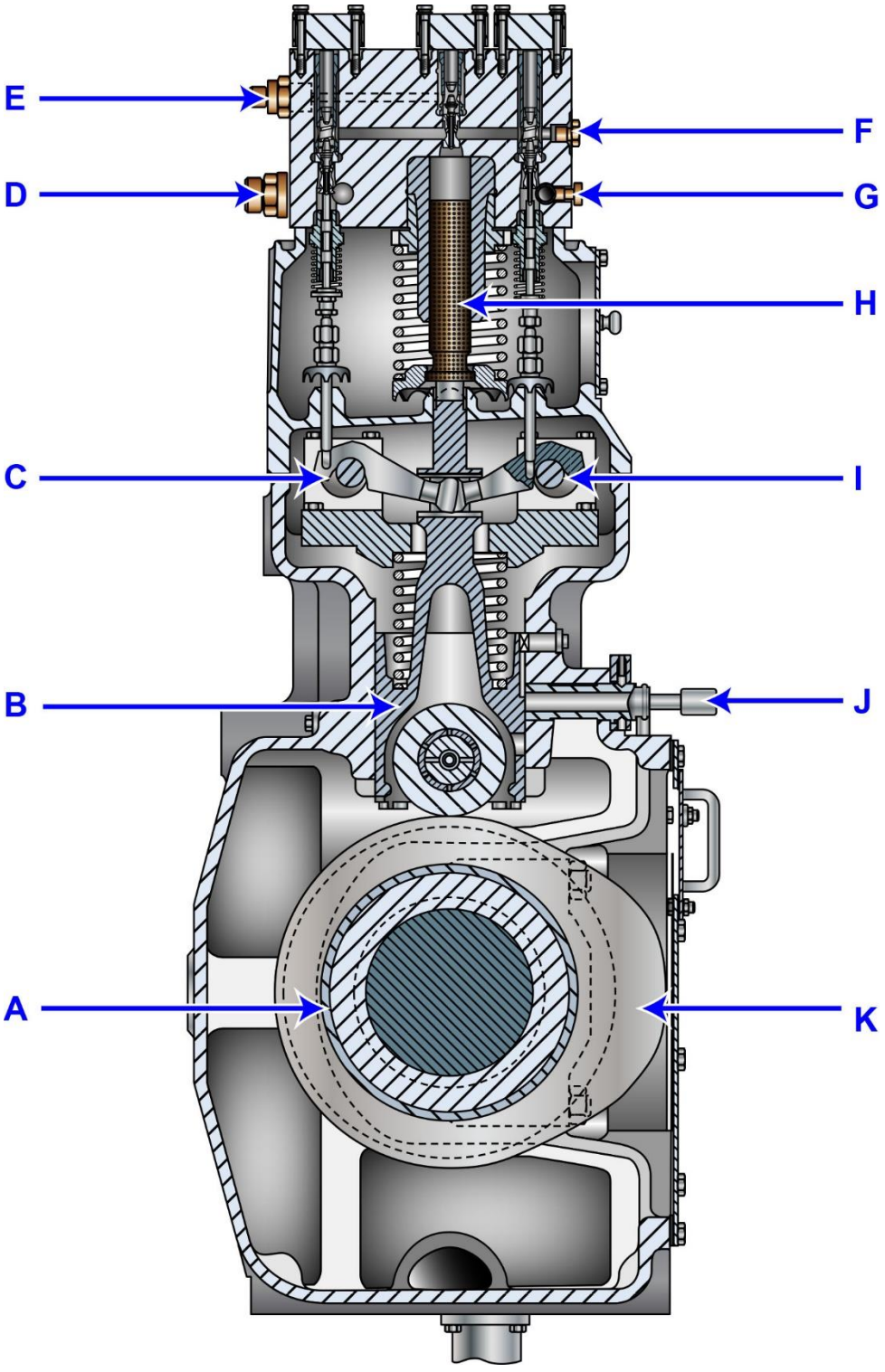
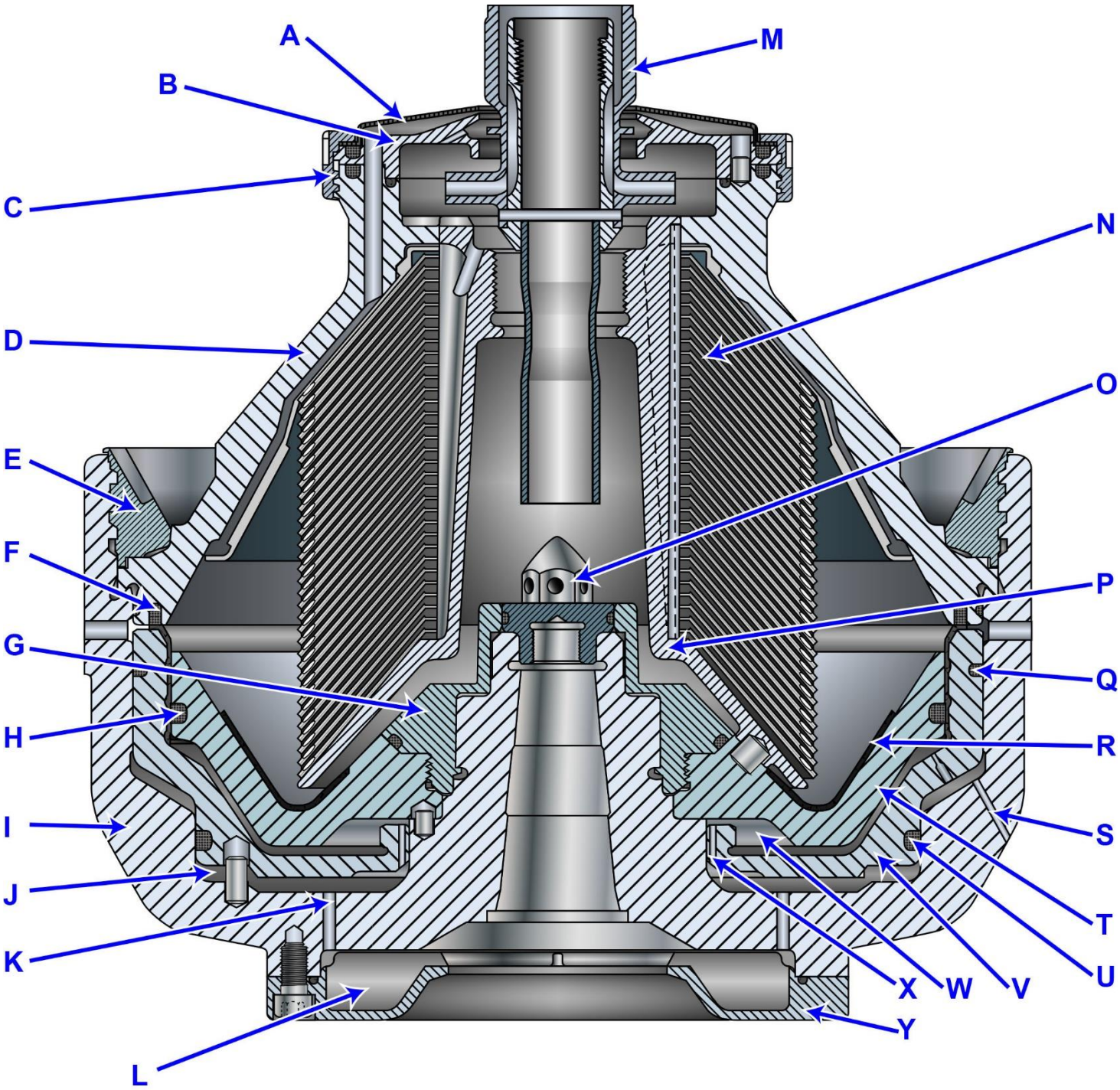


MO-0112



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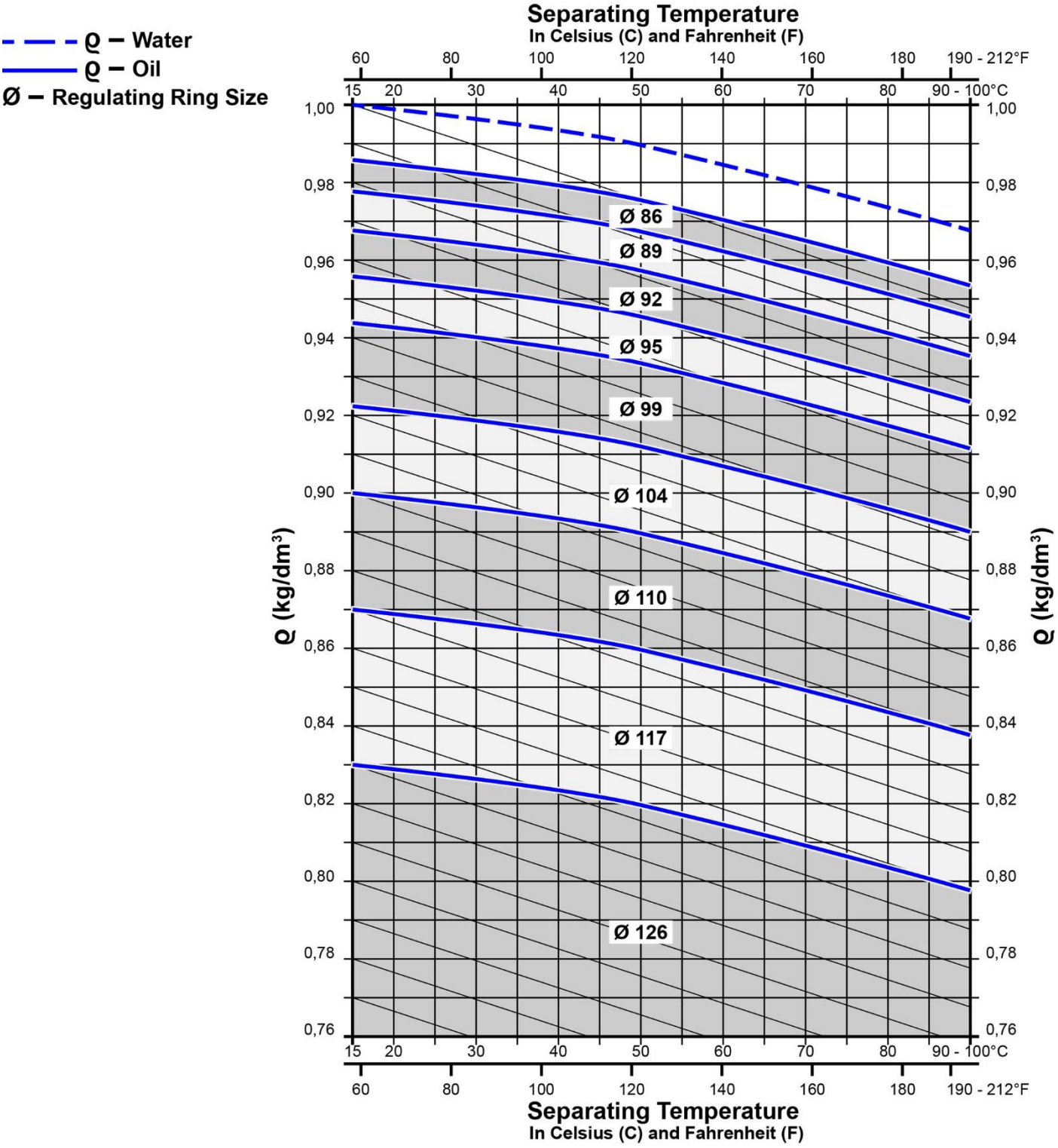
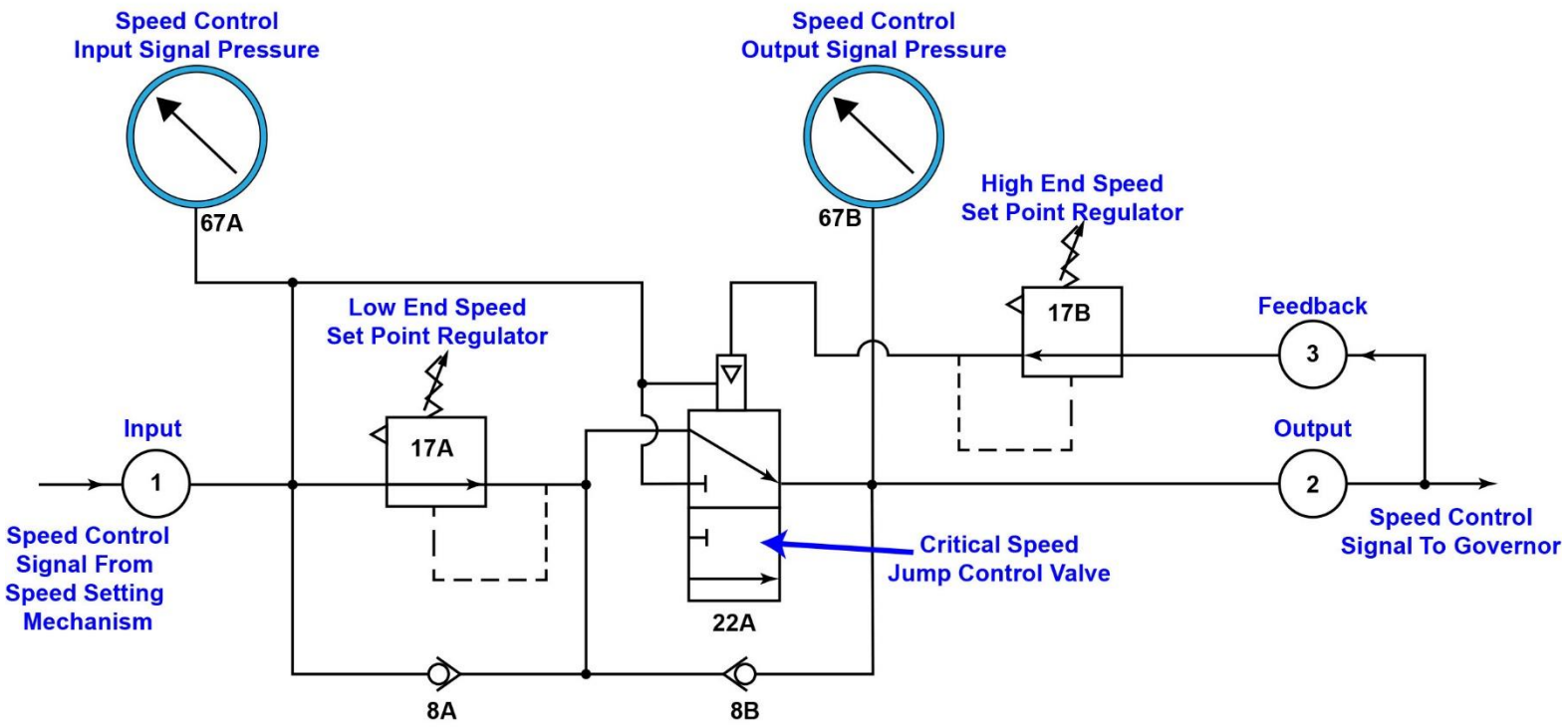


Adapted for testing purposes only from Instruction Manual and Parts List, Mineral Oil Separator with Self-Cleaning Bowl, Model OSA 20-02-066

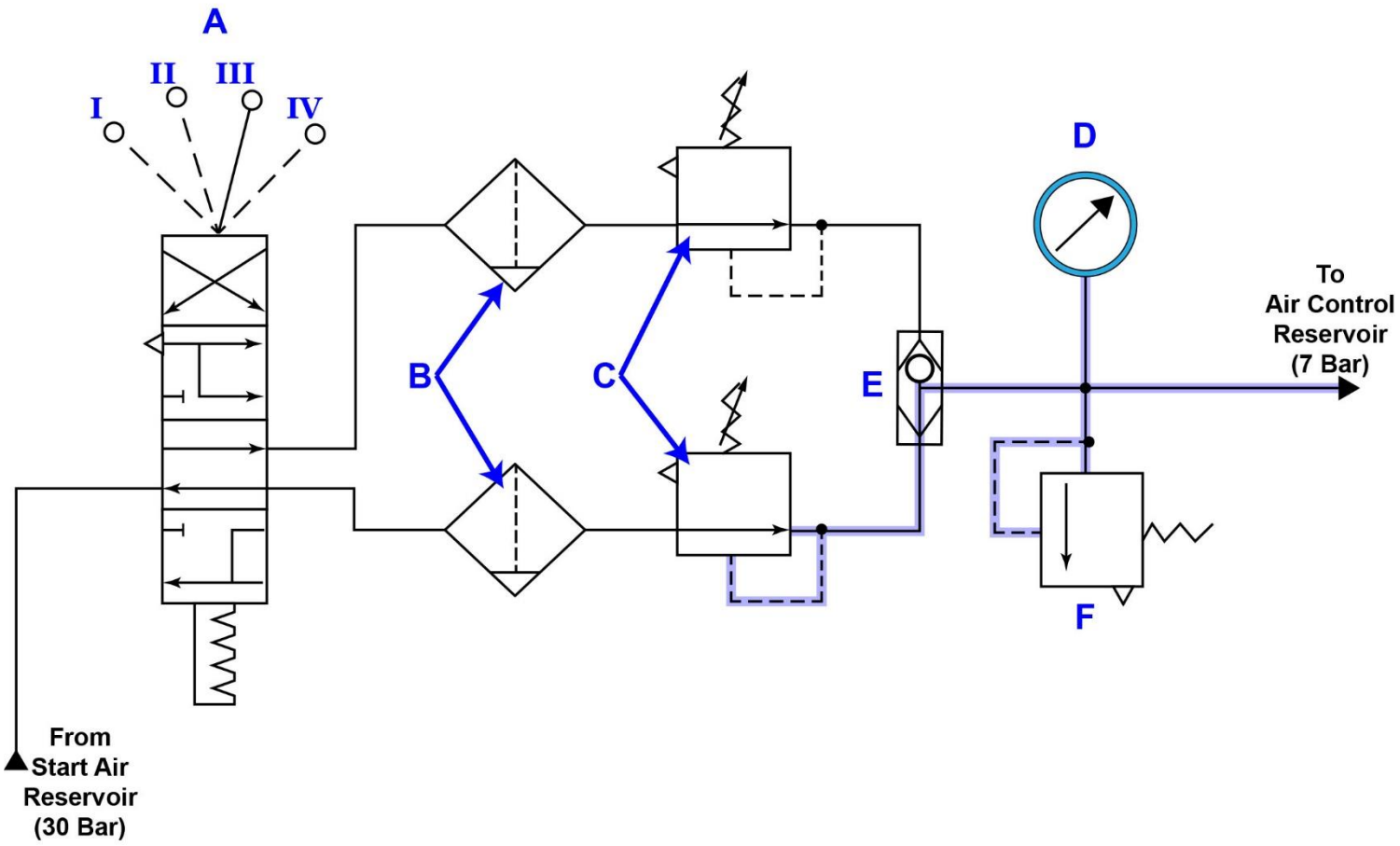
MO-0114

Critical Speed Jump Valves Group



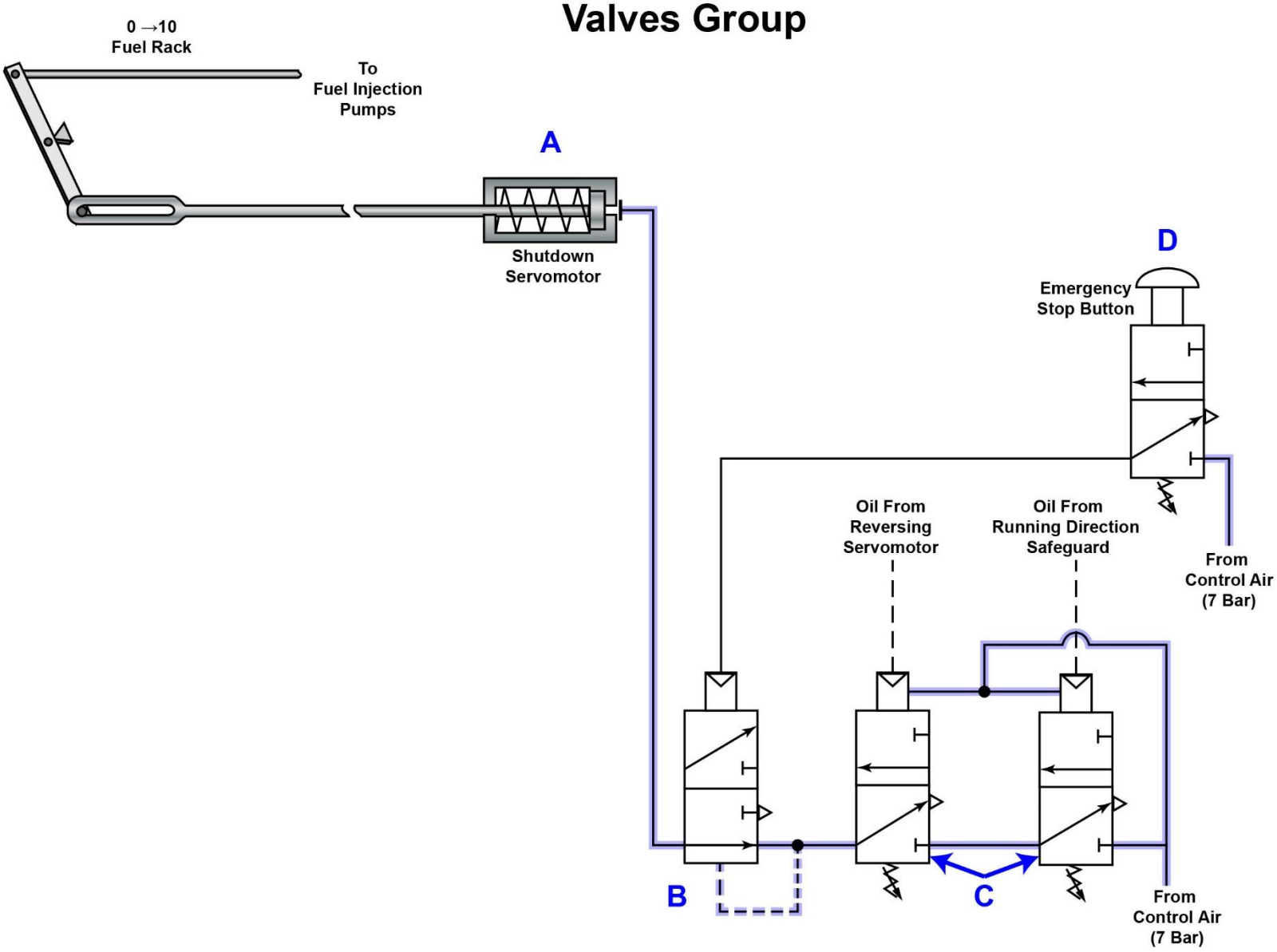
MO-0115

Control Air Pressure-Reducing Unit
Valves Group



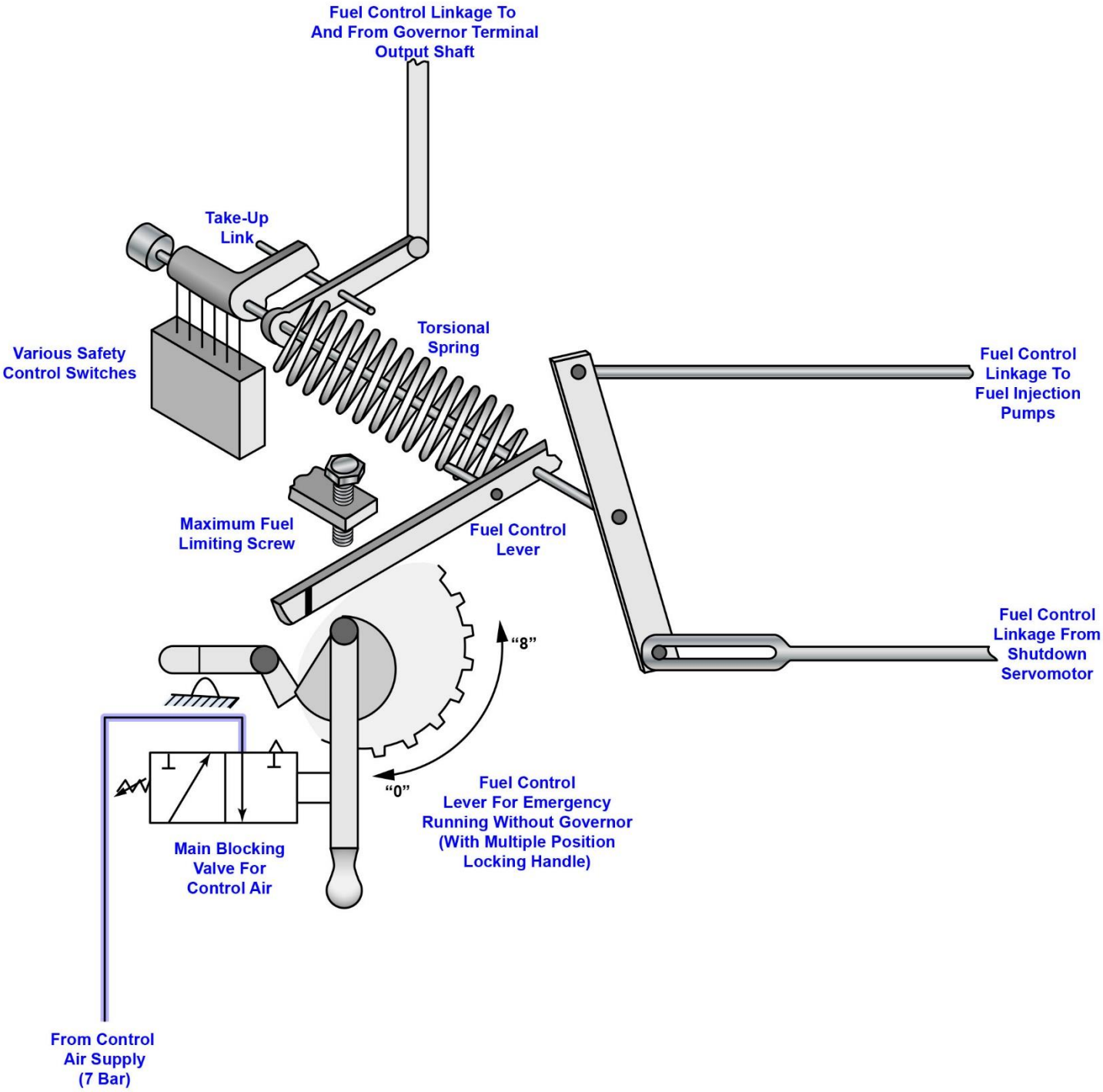
MO-0117

Fuel Blocking Valves Group



MO-0119

Fuel Control Linkage Arrangement



MO-0127

EPC Alarm Indications Program Unit			
Alarm from MARST1	Low pressure in oil outlet	High oil temperature after preheater	Low oil temperature after preheater
Emergency stopping or vibrations	No discharge	Logically wrong signal from 1st separator	Remote alarm signal only

MARST1 Alarm Indications Program Unit			
A01	**A02**	**A03**	**A04**
Abnormal water content	Transducer signal minimum value	No discharge feedback signal	Drain valve insufficient
A05	**A06**	**A07**	
Micro-processor error	Liquid indication	Transducer fault