BOOK	Question Number	Answer	Question	Choice A	Choice B	Choice C	Choice D	Illustration
14	2	B	Precision engine bearing inserts are manufactured with a small portion of the bearing ends extending beyond the bearing housing or caps. The installation process of these bearings requires sufficient _____.	overlap	crush	lap or lead	protrusion	
14	3	B	Where is a fusible plug installed on a Scotch or auxiliary boiler?	At the shell approximately 1 1/2 inches (3.8 cm) below the normal waterline.	At or near the center of the crown sheet of the combustion chamber.	In the furnace approximately 1 1/2 inches (3.8 cm) below the normal waterline.	In the furnace not more than 1 inch (2.54 cm) below the lowest permissible water level.	
14	4	A	Bearing wear on a split sleeve type bearing is measured with a _____.	ball anvil micrometer	pair of outside calipers and a dial indicator	pair of inside calipers	depth micrometer	
14	5	C	The amount of wear on a split precision main bearing can be accurately determined by comparing the data from a previous reading to the present readings taken with a _____.	dial indicating outside caliper	telescoping gauge	ball anvil outside micrometer	screw thread outside micrometer	
14	6	C	The amount of wear on a split, fixed sleeve-type, main diesel bearing can be accurately determined with a _____.	dial indicating outside caliper	spider gauge	ball anvil outside micrometer	screw thread outside micrometer	
14	7	A	The RPM of "A" is 100 and hobbed with 76 teeth. If gears "B", "C", and "D" have 60, 32, and 42 teeth respectively, the RPM of "D" in the gear train illustration is _____.	339.29 RPM	96.51 RPM	267.86 RPM	76.19 RPM	See illustration number(s): MO-0088
14	8	A	Crank web deflection readings will give a positive indication of _____.	worn main bearing journals	torsional stress deformation	slack thrust bearings	bearing shells shim dimensions	
14	9	C	When a diesel engine is equipped with a hydraulic starting system designed to operate at pressures of 150 psi or more, Coast Guard Regulations (46 CFR) require that the hydraulic fluid shall _____.	have a viscosity index number greater than 100	have a flash point of not greater than 200°F	have a flash point of not less than 315°F	be oxidation resistant and nontoxic	
14	10	C	After an engine has been started using a Bendix drive unit, the drive gear, or pinion disengages from the flywheel due to _____.	the action of a spring	rotation of the starting cam	the higher rotating speed of the flywheel	accumulator pressure	
14	11	A	What preventative maintenance should be done frequently to diesel engine starting air receivers?	Drain the accumulated moisture.	Test the relief valves.	Watch the temperature to prevent fluctuations in pressure.	Clean the interior to remove oil and foreign matter.	
14	12	D	Coast Guard Regulations (46 CFR) permit drain valves in the machinery space for removing water and impurities from diesel engine fuel systems. Those valves must be _____.	ball-check valves to prevent leakage	automatically closed by a solenoid	connected through the tank top	fitted with caps or plugs to prevent leakage	
14	13	B	According to the diagram shown in the illustration, the lube oil system can best be described as a _____.	dry sump system	wet sump system	shunt system	bypass system	See illustration number(s): MO-0007
14	14	D	The RPM of "D" is 600 and hobbed with 48 teeth. If gears "A", "B", and "C" have 84, 66, and 22 teeth respectively, the RPM of "A" in the gear train illustration is _____.	111.63 RPM	66.67 RPM	460.47 RPM	114.29 RPM	See illustration number(s): MO-0088
14	15	C	Where diesel engine speed and clutch controls are combined into one operation by a single control lever, movement of the lever from the "stop" position to the "ahead" position will FIRST _____.	decrease the engine speed	increase the engine speed	engage the ahead clutch	disengage the astern clutch	

14	16	D	In comparison to exhaust valves, intake valves of diesel engines may be fabricated from low-alloy steels because _____.	the beveled edges of the intake valves provide for self-centering during seating	intake valves utilize stellite-coated valve seat inserts which reduce wear	the volume of air passing through intake valves is less than the volume of air passing through exhaust valves	intake valves are less affected to the corrosive action of exhaust gases	
14	17	B	Fusible plugs are installed in fire-tube boilers to _____.	provide a means of draining the boiler	warn the engineer of low water level	cool the crown sheet at high firing rates	open the burners' electrical firing circuits	
14	18	B	Friction developing between the moving parts of a governor, governor linkage and control valve will cause the governor to _____.	react with insufficient speed droop	fail to react to small speed changes	have excessive sensitivity to small speed changes	remain in the neutral position	
14	19	B	The governor, shown in the illustration, will have its preset speed droop altered whenever _____.	the speeder spring tension is changed	the speed droop lever fulcrum is changed	the compensating lever fulcrum is changed	all of the above	See illustration number(s): MO-0092
14	20	A	The governor shown in the illustration can produce shutdown of the engine by _____.	rotating the load limit cam	lowering the pilot valve plunger	raising the actuating compensation piston	lowering the speeder rod	See illustration number(s): MO-0092
14	21	C	Which of the bearings listed are most widely used for the main and connecting rod bearings of a diesel engine?	Roller	Sleeve	Precision insert	Needle	
14	22	D	Coast Guard Regulations (46 CFR) permit the use of drain valves for removing water or impurities from diesel engine fuel systems. These valves must be _____.	self-closing gate valves	operated electrically	connected through the tank top	located in the machinery space	
14	23	B	Which of the following methods is normally used to lubricate bearings in a small high-speed diesel engine?	Splash lubrication	Pressure lubrication	Sight feed lubricators	Mechanical lubricators	
14	24	A	The auxiliary boiler feedwater level control shown in the illustration, utilizes _____.	two position differential gap action	proportional action	proportional plus reset action	proportional plus reset plus rate action	See illustration number(s): MO-0047
14	25	C	A loose crosshead plunger assembly in a metering or proportioning pump will cause _____.	rapid wear on the crosshead	damage to the stroke adjustment arm	rapid wear on the plunger packing	damage to the pressure compensator valve	
14	26	A	The parts labeled "I and II", shown in the illustration are properly called the _____.	intake and exhaust valves	scavenging poppets	fuel valves	exhaust valves	See illustration number(s): MO-0020
14	27	A	As the load is being decreased on the engine controlled by the governor shown in the illustration, the _____.	right hand end of the floating lever will move up	speeder rod will move down	pilot valve plunger will move down	oil pressure under the power piston will increase	See illustration number(s): MO-0092
14	28	B	A large change in ambient temperature, or using an oil of a viscosity different than the one recommended by the manufacturer in a mechanical hydraulic governor, will result in the need to adjust the _____.	pilot valve opening	compensating needle valve	compensating spring tension	accumulator spring tension	
14	29	C	Changing the position of the fulcrum in the compensating system of the governor shown in the illustration will _____.	force the thrust bearing down on the flyweight toes	change the speed of the rotating bushing	change the amount of stroke available to the actuating compensating piston	change the stroke of the load limit shutdown lever	See illustration number(s): MO-0092
14	30	A	To check the setting of the overspeed trip on a diesel powered generator, you would use a _____.	tachometer	torsion meter	dynamometer	pony brake	
14	31	A	Which of the following is an example of a solid bearing?	Piston pin bushing	Turbo-generator turbine bearing	Spring bearing	Thrust bearing	
14	32	A	Coast Guard Regulations (46 CFR) require steel tubing connections and fittings used with diesel fuel oil systems, to be either flared or _____.	of the flareless nonbite type	silver soldered	have welded flanges	have seal-welded threads	
14	33	B	In an auxiliary diesel engine bypass type lubricating oil system, the main lube oil pump forces _____.	all of the oil used by the engine through a filter	some of the oil used by the engine through a filter	some of the oil used by the engine through a centrifuge	all of the oil used by the engine through a centrifuge	

14	34	C	The pneumatic circuit shown in the illustration is part of a complex control circuit for a large low speed diesel engine. How will the operation of the engine be affected if the line from the double check valve to the servo motor is severed?	The engine will continue to operate; however, restarting of the engine will be difficult.	The engine will automatically stop, although there will be no difficulty in restarting the engine.	The shutdown servo motor will develop a force overriding the the output of the governor, causing in the fuel to the engine to be secured.	The safeguard provided by these devices will result in a temporary cessation of air flow through valve "D".	See illustration number(s): MO-0117
14	35	C	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?	The circuit shown is used to shift the cam shaft position when reversing the engine.	The piston labeled A provides a low pressure signal to the other components illustrated.	Valve D, when depressed, allows the retained pneumatic pressure within the shut-down servo motor to be relieved.	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.	See illustration number(s): MO-0117
14	36	B	In a naturally aspirated diesel engine, the volume of air intake is directly related to engine _____.	compression ratio	valve size	fuel pressure	cylinder clearance volume	
14	37	D	Which of the following statements describes the function of the unit shown in the illustration as found on some medium speed diesel engines?	The wye arrangement provides variable positioning of the intake port dampers.	The braking unit prevents engine rotation by the engagement of brake splines into the ends of the camshaft.	The reciprocating action of the device provides prestart lubrication to the cylinder walls.	The arrangement is used to position the cam shafts for the desired direction of engine rotation.	See illustration number(s): MO-0125
14	38	C	In a bypass type filtering system for a medium or high speed diesel engine, the lube oil bypassing the filter _____.	returns directly to the suction side of the pump	returns directly to the sump	flows to the engine bearings	flows through a second-stage strainer, reheater, and returns to the sump	
14	39	D	Two important considerations for the proper lubrication of a diesel engine include, the delivery of the oil in sufficient amount, and the _____.	cetane number	pour point	viscosity temperature	quality of the oil	
14	40	D	Friction, engine wear, and oil consumption in a diesel engine are directly related to the _____.	acidity of the oil	pour point of the oil	flash point of the oil	viscosity of the oil	
14	41	D	In a diesel engine, the main bearings are used between the _____.	connecting rod and the crankshaft	wrist pin and the connecting rod	camshaft and the engine block	crankshaft and the engine block	
14	42	D	The replacement piping for diesel engine high pressure fuel systems must be the same length and diameter as the original piping to _____.	avoid unnecessary parts inventory	keep torsional vibration constant	use existing supports and braces	maintain specified injection characteristics	
14	43	D	Heat exchangers are most commonly found in a small auxiliary diesel engine _____.	fuel oil system	governing system	air starting system	lube oil system	
14	44	C	The pneumatic, shut down circuit shown in the illustration is part of a complex, large, low speed, engine speed control system and may be activated by three different signals. Which of the following statements describes the points of origin?	One signal is derived from the manually operated valve "D", while the other two are generated by the main lube oil and cylinder lubrication systems.	A 7 bar air supply pressure provides all three causative signals to the shut down servomotor, with the operating medium provided by the main bearing lube oil supply.	The signals are generated via the manually actuated valve, the reversing servomotor and the rotation direction safeguard system.	None of the above is correct.	See illustration number(s): MO-0117
14	45	C	Diesel engine jacket water is used in the distillation process as the _____.	coolant for the distillate	coolant for the brine cooler	means of heating the feedwater	primary means of producing a vacuum within the distiller	

14	46	B	Multiple concentric valve springs are often used with diesel engine valves to _____.	enable research and development of cam contour to be simplified	operate the valve gear where a larger force is normally required, but space limitations restrict the use of a single large spring	allow for easier valve replacement	enable a total smaller valve spring force to keep the valve tight on its seat	
14	47	B	The RPM of "D" is 600 and hobbed with 46 teeth. If gears "A", "B", and "C" have 94, 80, and 30 teeth respectively, the RPM of "A" in the gear train illustration is _____.	84.38 RPM	110.11 RPM	510.64 RPM	71.81 RPM	See illustration number(s): MO-0088
14	48	C	A controllable pitch propeller on a diesel driven vessel eliminates the need for _____.	friction clutches	disconnect clutches	reversing gears	reduction gears	
14	49	A	When the prime movers of two paralleled generators are equipped with mechanical-hydraulic governors, and are operating within their designed range, the unit with the least amount of speed droop will _____.	pick up more of any increase in load	pick up less of any increase in load	share an equal amount of any increase in load	drop an equal amount of any decrease in load	
14	50	C	The function of the device shown in the illustration is used to _____.	slide the camshafts to insure proper lubrication	provide the engine with a braking device	change the directional rotation of the engine	eliminate the need for mechanical interlocks	See illustration number(s): MO-0125
14	51	C	Which of the listed bearing installations is subjected to swinging motion?	Crankshaft journal	Crankpin bearings	Wrist pin bearings	Thrust bearings	
14	52	B	To prevent vibration damage to the fuel supply line of a diesel engine, you may use _____.	a short length of heavy duty clear plastic tubing	a length of approved flexible nonmetallic hose	welded flange connections for all joints	aluminum piping with expansion loops	
14	53	C	One advantage of vacuum feed type cylinder lubricators over the liquid sight glass type is _____.	there are fewer moving parts	adjustment is not required	better metering accuracy	a lower grade of oil may be used	
14	54	A	Cooling water pumps driven by direct reversing diesel engines are usually of the straight impeller vane type pump with a concentric housing to _____.	provide cooling water flow when the engine is running either ahead or astern	provide the greatest pump efficiency	prevent pump clogging from marine growth	prevent cavitation at the pump outlet	
14	55	D	The diesel engine component labeled "5", shown in the illustration is known as the _____.	piston crown	connecting rod end assembly	heat sink space	thrust washer	See illustration number(s): MO-0122
14	56	A	If the combustion control system of an automatically fired auxiliary boiler fails to sustain burner ignition after a normal shutdown, you should check for a/an _____.	faulty photocell detector	low steam pressure	high voltage on the ignition electrode	open air damper	
14	57	B	Concerning the diesel engine shown in the illustration, which of the following represents the number of crank angle degrees of rotation existing between each firing? (See illustration MO-0038.)	60,	120,	180,	240,	See illustration number(s): MO-0038
14	58	B	In the overrunning clutch shown in the illustration, if "A" were traveling faster than "B", the clutch is considered to be _____.	engaged	disengaged	worn out	stripped	See illustration number(s): MO-0034
14	59	D	Regarding the overrunning clutch shown in the illustration, you would expect _____.	"A" to travel in a direction opposite to "B"	"A" to drive "B" in the indicated direction of rotation	"B" to drive "A" at any speed of "A" or "B"	"B" to drive "A" when "B" provides the power for rotation	See illustration number(s): MO-0034
14	60	B	The term "PLAN/33,000" is equal to the _____.	BMEP	IHP	BHP	SHP	
14	61	A	Bearing "crush" as applied to diesel engine main bearings, will result in _____.	positive seating of the bearings in their housings	above normal operating temperatures	damage to the journals	damage to the bearings	
14	62	D	Which of the listed types of gasket material should be used on high pressure fuel oil lines on a diesel engine?	Fiberglass	Sheet asbestos	Neoprene	Soft copper	

14	63	B	Motor vessels usually have independent lube oil systems for main engine and main reduction gears because _____.	coolers are not needed for the gear system	contaminants produced by the engine could harm the reduction gears	non-additive oils are used in the main engine system	different type centrifuges are required for the main engine and reduction gear lube systems	
14	64	A	In the engine shown in the illustration, the part labeled "W" is cooled by _____.	seawater	air	lube oil	convection	See illustration number(s): MO-0003
14	66	A	Clearance volume scavenging in a turbocharged, four-stroke/cycle diesel engine is accomplished _____.	during the valve overlap period	with only the exhaust valve open	at a pressure below atmospheric	without cooling the cylinders or pistons	
14	67	C	Mist detectors used on large low-speed main propulsion diesel engines monitor and check for the presence of _____.	fuel oil vapor at the sludge tank vent	unburned fuel vapors in the scavenge air receiver	lube oil vapors in the crank case	lube oil vapors in the engine room	
14	68	D	Which of the following is the required operating medium for the reversing mechanism shown in the illustration?	Hydraulic oil	Compressed air	Lube oil and hydraulic oil	Compressed air and lube oil	See illustration number(s): MO-0125
14	69	A	The diesel engine wrist pin in the illustration is indicated by the component labeled _____.	"7"	"G"	"17"	"S"	See illustration number(s): MO-0122
14	70	A	How may water be removed from the bowl of the separator as shown in the illustration?	The water may be removed through the water drain valve or through the sludge ports during the sludge discharge cycle.	The separator is used to remove solids from the processed liquid, therefore the accumulation of water does not present a problem.	When the unit is secured and the bowl stops rotating, the water is drained off the bottom of the bowl through orifice ports.	Water may only be removed from the bowl when the unit is secured and the bowl hood is removed.	See illustration number(s): MO-0127
14	71	C	A main propulsion diesel engine crankshaft bearing lacking sufficient "crush", will _____.	pound under load	be lubricated more easily than with sufficient crush	tend to rotate with the journal	have its back forced against the seat under load	
14	72	C	In the slow speed diesel engine shown in the illustration, the part labeled "E" is the _____.	high pressure lube oil line	low pressure lube oil line	high pressure fuel line	low pressure fuel line	See illustration number(s): MO-0003
14	73	C	The part labeled "X" shown in the illustration is a _____.	fuel line	water line	lube oil line	control linkage	See illustration number(s): MO-0003
14	74	B	The diesel engine shown in the illustration, which of the lettered parts listed is cooled by sea water?	Q	W	Y	P	See illustration number(s): MO-0003
14	75	D	Which of the bearings listed is most widely used for main and connecting rod bearings of modern diesel engines?	Steel-lined	Poured babbitt, self-aligning	Split roller	Precision insert	
14	76	B	Directional intake ports in diesel engines are used to _____.	reduce air charge turbulence	induce air swirl	deflect hot combustion gas away from the valves	oppose the effects of piston induced squish	
14	77	C	Before any work is to be carried out on a burner in an automatically fired auxiliary boiler, you should always _____.	block all control system relays closed	allow the boiler to cool completely	close all manually operated fuel valves	lock all safety interlock switches closed	
14	78	D	Generating tubes in waste heat boilers are finned to _____.	reduce gas flow turbulence	prevent exhaust gas corrosion	increase the rate of combustion	increase the rate of heat transfer	
14	79	B	If an operating auxiliary boiler has a water pH reading of 7, you should _____.	bottom blow the boiler	treat the water with caustic soda	treat the water with chemical scavengers	reduce the water alkalinity to recommended readings	
14	80	A	Which of the following conditions is responsible for the fuel oil to atomize when using a steam atomizer in an auxiliary boiler?	Expansion of the steam in the furnace.	Expansion of the steam in the whirling chamber.	Expansion of the steam in the orifice plate.	All of the above.	
14	81	B	Diesel engine main and connecting rod precision bearings are made in halves. Each half exceeds one-half the bearing circumference by a small amount. The small amount is termed _____.	clearance	crush	pitch	thrust	

14	82	D	Fuel is admitted to a diesel engine cylinder through the _____.	intake valves	carburetor	exhaust ports	injector nozzles	
14	83	C	The piston rod scraper box incorporated in a two-stroke/cycle, crosshead diesel engine serves to _____.	eliminate the necessity for an oil scraper ring	prevent side thrust and cylinder scoring	prevent sludge and dirty oil from entering the crankcase	scrape oil and carbon deposits off the cylinder walls	
14	84	A	The large, slow-speed, main propulsion diesel engine shown in the illustration, the part labeled "B" contains _____.	water	oil	diesel oil	exhaust gas	See illustration number(s): MO-0003
14	85	C	The fitting labeled "A" for the device shown in the illustration is used to connect the reversing cylinder to the _____.	shaft stopping system	automatic stop solenoid	pneumatic control circuit	actuating oil supply system	See illustration number(s): MO-0125
14	86	B	The diesel engine connecting rods shown in the illustration are distinctively named _____.	hook and nail	fork and blade	male and female	left hand and right hand	See illustration number(s): MO-0122
14	87	B	What activates the water drain valve (V5) of the separator as shown in the illustration?	Activation of the drain valve occurs when the associated increase of oil pressure is sensed by the transducer, causing the signal from the controller to decrease.	The transducer detects the presence of water in the processed oil. It then sends a signal to the controller which initiates the opening of the drain valve.	The water under centrifugal force developed within the bowl acts upon the underside of the valve, overcoming the opposing spring force, causing it to open.	The water drain valve is used primarily when the bowl is flushed preceding a shut down period. Its opening is the result of a pre-programmed memory format.	See illustration number(s): MO-0127
14	88	A	A failure to any component of a flame safeguard control for an automatically fired auxiliary boiler, will result in _____.	the prevention of automatic restart	an immediate furnace explosion	uncontrolled firing	automatic restart	
14	89	A	When an auxiliary boiler is on the line, the output of the flame scanner can be checked by placing a microammeter in series with the photoelectric cell circuit. The readings on high fire should be _____.	higher than those at low fire	equal to those at low fire	lower than those at low fire	lower than those at low fire, but the generated voltage will be higher	
14	90	B	A feed pump for an auxiliary boiler might lose suction if the _____.	boiler water level is low	feedwater is too hot	boiler steam demand is low	feedwater is too cold	
14	91	B	The proper location for journal bearing oil grooves is _____.	in the region of the load bearing surface	as a side relief where the two shells meet	at the bottom of the bearing	halfway between bottom and where shells meet	
14	92	B	The unit shown in the illustration is called a/an _____.	combustion rod	fuel injector	interstage unloader	governor relief valve	See illustration number(s): MO-0041
14	93	D	How are hydraulic valve lash adjusters on diesel engine rocker arm assemblies lubricated?	Cup-fed grease	Sealed self-lubricators	Metered hydraulic oil supply	Forced lube oil supply	
14	94	B	Trunk-type diesel engine pistons are most effectively cooled by heat _____.	conducted through the engine block	conducted to water cooled cylinder walls	conducted through the piston crown	losses to escaping exhaust gases	
14	95	D	The amount of oil consumed by a return flow-type fuel atomization system, fitted with both supply and return meters, can be determined by the _____.	supply meter reading only	return meter reading only	sum of the supply and return meter readings	difference between the supply and return meter readings	
14	96	A	Which letter represents the scavenging air system nonreturn valve in the illustration?	P	Q	W	U	See illustration number(s): MO-0003
14	97	B	Which of the following methods is used with a varying load on an auxiliary boiler equipped with the burner assembly shown in the illustration?	An oil control valve in the fuel return line controls the combustion rate.	The burner is cycled "on" and "off" in response to boiler pressure.	The ignition electrode is fired from a step up transformer.	The triple nozzle assembly responds to a low steam pressure signal from a pyrostat.	See illustration number(s): MO-0098
14	98	C	Main propulsion diesel engines having a bore exceeding 300 mm are to have at least _____.	two independent means of starting the engine	five air starting valves to permit the admission of starting air at any crank angle	one (explosion relief) valve at the position of each main crank throw	two engine driven lube oil pumps capable of parallel operation	

14	99	B	The water in a steaming auxiliary boiler should be tested daily for _____.	dissolved oxygen	chlorides	sludge	dissolved nitrogen	
14	100	C	A portion the pneumatic control circuit for a large low speed diesel engine is shown in the illustration (see booklet). Which of the following conditions would occur if the line between valves "B" and "D" were to be severed?	The engine would stop abruptly due to the loss of pressure at shut down servo motor.	This damage would require an emergency stop to prevent the engine from overspeeding.	The engine would continue to operate, although the damaged line should be repaired immediately.	The engine would first stop, then automatically reverse its direction of rotation.	See illustration number(s): MO-0117
14	101	A	The programmed control system of an automatic auxiliary boiler will terminate the light off process during the prepurge period if air flow is not sensed and _____.	the damper is not sufficiently open	the damper is not fully closed	oil pressure is not sensed	water pressure is not sensed	
14	102	C	The fuel injector shown in the illustration is opened by fuel pressure acting upward on _____.	part #33	part #36	the needle valve	the plunger	See illustration number(s): MO-0059
14	103	C	Integral water jacket liners use O-rings near the bottom of the liner. These O-rings serve to _____.	form a water seal between the liner and engine block	allow for slight misalignment of the liner	prevent the escape of lubricating oil from the crankcase	ensure proper temperature flow between the liner and engine block	
14	104	C	Telescopic pipes to the piston of a large slow-speed main propulsion diesel engine are designed to prevent _____.	excessive crankcase pressure	excessive lube oil temperature	contamination of the lube oil by water	contamination of the cooling water by lube oil	
14	105	B	Reduction gear lube oil temperatures for keel cooler installations are generally _____.	lower than raw water cooled installations	higher than raw water cooled installations	identical to raw water cooled installations	lower than raw water cooled installations, but the pressure will be higher	
14	107	D	The cylinder labeled "B", in the illustration is used to retain _____.	oil used to lubricate component "F"	a specific volume of air and an operating bladder	the required quantity of grease to reduce maintenance intervals	the fluid required to produce the reciprocation of component "F"	See illustration number(s): MO-0125
14	108	C	Fork and blade type diesel engine connecting rods are shown in the illustration. Which letter combinations represent these components?	"R" and "10"	"M" and "13"	"P" and "10"	"T" and "10"	See illustration number(s): MO-0122
14	109	A	Microbiological growths in marine fuel are a common occurrence that can be _____.	extremely detrimental to equipment and operating processes	prevented by maintaining proper storage temperatures	removed from emulsified fuel oil during the centrifuging processes	All of the above are correct.	
14	110	D	The flame safeguard control system of a large automatic auxiliary boiler will provide fuel shut off in the case of high _____.	water	voltage	fuel pressure	steam pressure	
14	111	A	A characteristic of a bearing material which permits small dirt particles to become embedded in it's surface is _____.	desirable, as it will prevent damage to the journal surface	desirable, as it will assist in keeping the lube oil filters clean	undesirable, since the embedded particles will score the journal	undesirable, since the particles will interfere with lube oil flow	
14	112	D	Fuel oil begins injection into the cylinder of a four-stroke/cycle diesel engine during the _____.	intake stroke	exhaust stroke	power stroke	compression stroke	
14	113	C	Lube oil pumps taking suction from the sump of most small marine engines are usually _____.	of the diaphragm type	of the centrifugal type	of the positive displacement type	independently driven by electric motors	
14	114	C	A large, low-speed, main propulsion diesel engine uses sea water to directly cool the _____.	cylinder heads	exhaust valves	scavenging air	injectors	

14	115	D	The 7 bar control air supply shown in the illustration has failed. Which of the following statements represents the automatic action that will occur?	The pressure switch, labeled as "C", will energize the automatic shutdown circuitry, preventing any additional operating casualty.	Valve "D" will shift to the position shown, with the signal generated from line "ff" determining the speed of the engine, as the signal is modified by device "A".	By regulating the reduction of the 30 bar air pressure at device "B", the engine speed may be varied proportionally, operating independently of any other control.	Valve "D" will shift, no longer venting line "cc", 30 bar air pressure is reduced by "B", and is supplied to "A" for speed control, and other functions of lines "cc" and "ff".	See illustration number(s): MO-0118
14	116	B	In the diesel engine shown in the illustration, the purpose of the part labeled "P" is to _____.	cool the scavenge air	ensure one way air flow into the air header	boost the scavenge air pressure	provide turbulence in the scavenge air	See illustration number(s): MO-0003
14	117	D	The total starting air capacity required for reversible main engines is to be sufficient for a least _____.	six consecutive starts	eight consecutive starts	ten consecutive starts	twelve consecutive starts	
14	118	C	Which of the following statements represents the proper procedure for checking the oil levels in the reversing cylinders, labeled "B" and "C" shown in the illustration?	Place the engine in the ahead direction, add oil in the ahead cylinder until 3/4 full and repeat for the astern cylinder.	Stop the sliding movement of the camshaft at midpoint, fill each cylinder to exactly halfway, replace the fill plugs and check for leaks during testing.	Position the engine in the astern running position, add oil to the ahead cylinder until it is 3/4 full and carry out the opposite procedure for the astern cylinder.	No oil level is maintained in this arrangement; the unit operates with compressed air only.	See illustration number(s): MO-0125
14	119	D	What is the function of component "13" shown in the illustration?	The inlet jumper directs cooling water to the cylinder liner.	The sample tube monitors the cylinder for evidence of piston blowby.	The oil pipe is the mechanism in which the "shaker" method of piston cooling is accomplished.	The device delivers the oil for piston cooling, in addition to liner lubrication.	See illustration number(s): MO-0122
14	120	B	The light and medium fuels utilized in internal combustion engines provide a source of _____.	lubrication for pistons and rings	food for microbiological organisms	gases most detrimental to the ozone layer of the atmosphere	all of the above	
14	121	B	The submerged electrode low water cutoff used in some automatically fired auxiliary boilers, will secure the burner fuel supply if the boiler water level _____.	touches the bottom of the electrode	drops below the electrode tip	changes from low to high level	remains constant and unvarying	See illustration number(s): MO-0047
14	122	A	Most fuel injection nozzles are opened by _____.	fuel oil pressure	a cam operated follower	a spring-loaded pressure plate	timing gears keyed to the crankshaft	
14	123	D	The lube oil pump used in a diesel engine is a _____.	volute pump	centrifugal pump	diaphragm pump	gear pump	
14	124	B	The boiler water alkalinity in a coil-type auxiliary boiler should be maintained at the pH recommended by the boiler manufacturer to _____.	precipitate silica from solution	reduce corrosion in the heating coil	prevent clogging and erosion in the coil	maintain zero water hardness	
14	125	A	Coast Guard Regulations (46 CFR) require the controls for automatically fired auxiliary boilers, must be fitted with visible indicators to signal _____.	fuel oil shutoff due to flameout	low voltage in the flame scanner circuit	high boiler water level	high steam pressure	
14	126	B	The device shown in the illustration is a _____.	three-way spring valve	hydraulic lash adjuster	multi-directional relief valve	valve stem spring cap	See illustration number(s): MO-0070
14	127	B	When a waste heat boiler is installed in the exhaust of a main propulsion diesel engine, the exhaust gas bypass would be used _____.	at high loads to prevent overheating	at low loads to prevent corrosion in the boiler	during periods of high steam demand	when the turbocharger is in operation	
14	128	D	How is the concentration of dissolved oxygen in the feedwater of an auxiliary boiler maintained at acceptable limits?	Feedwater is cycled through a DC heater.	Feedwater is treated with phosphates.	Oxygen is liberated in the three-stages of feedwater preheating.	Oxygen is liberated by maintaining the highest practical feedwater temperature.	

14	129	D	Fuels as produced in a refinery are generally sterile, however, contamination can occur as fuels are _____.	stored at the refinery	stored on the vessel	transported to the distribution sites	All of the above are correct.	
14	130	D	Which of the listed types of control systems is required by Coast Guard Regulations (46 CFR) for large automatic auxiliary boiler heating equipment?	Flame safeguard control system	Programming control system	Limit control system	All of the above	
14	131	C	Which bearing half will receive the greatest load in a two-stroke/cycle diesel engine?	Lower half of the connecting rod bearing at the crankshaft end of the rod.	Upper half of the main bearing.	Lower half of the piston pin bearing in the connecting rod.	All bearing halves share an equal load.	
14	132	D	Injection pressure in a common rail fuel system is controlled by _____.	engine speed	varying the fuel pump piston stroke	varying the injector needle valve clearance	a bypass valve	
14	133	D	Maximum lube system operating pressure for a diesel engine is normally regulated by a/an _____.	orifice in the pump suction	special filter design	pressure drop through the filter	relief valve	
14	134	A	Which of the following items is necessary for all waste heat boiler installations, regardless of design or manufacturer?	Control of evaporation	A separate means to prevent feedwater contamination	Power circulating pump	Superheater	
14	135	D	What effect will the engaged jacking gear have on the operation of the pneumatic circuit shown in the illustration?	The circuit will prevent the engagement and operation of the jacking gear.	Only the limit switch operation will be affected if the jacking gear handle is moved excessively.	Jacking gear interaction with the pneumatic control circuit is not used in this system.	The engagement of the jacking gear will prohibit any useful operation of the system.	See illustration number(s): MO-0118
14	136	A	A naturally aspirated diesel engine at full throttle will have an intake manifold pressure _____.	slightly less than atmospheric pressure	approximately equal to exhaust manifold pressure at all times	that is widely fluctuating	constantly decreasing as engine load increases	
14	137	D	When it becomes necessary to replace any tubes in a water-tube auxiliary boiler to eliminate leaks at the tube seats, the replacement tubes should be _____.	stress relieved to ensure expansion when rolled	annealed to prevent cracking when rolled	fitted with a welded backing ring in the seat area	rolled, beaded, and seal welded around the bead edge	
14	138	D	What is the function of component "G" shown in the illustration?	The blocking controller assists in maintaining the reversing control in its end positions.	The roller "G" is incorporated into the device to reduce the frictional forces acting upon component "F".	Roller "G" develops an output pressure at fitting "H", directly proportional to the rate of reciprocation of component "D".	The blocking roller, utilizing spring force and engine oil pressure, maintains the reversing control in its two end positions.	See illustration number(s): MO-0125
14	139	A	Item "17" in the illustration is the dipstick. When should the length of the dipstick be changed?	In most situations this would never be done.	If the operating oil level of the engine is consistently below normal, it will be necessary to use a longer dip stick.	When changing the oil in an operating engine, it may become necessary to use a longer stick to obtain the exact location of the oil level at all times.	If sludge buildup on the bottom of the pan becomes excessive, it will become necessary to shorten the dipstick to accommodate for the false oil level reading.	See illustration number(s): MO-0122
14	140	C	In order for microbiological growths to thrive in a fuel tank it is necessary for _____.	high temperatures to exist	low temperatures to exist	small amounts of water to be present	large amounts of water to be present	
14	141	A	Which of the statements represents a characteristic of the thrust collar in a Kingsbury thrust bearing?	It turns with the shaft and the pivot shoes do not rotate.	It is stationary and the shoes turn with the shaft.	It is turned by the base ring of the bearing.	It is held in position by the bearing base ring.	
14	142	A	During the fuel injection period, fuel pressure must exceed cylinder gas pressure to _____.	ensure penetration and distribution of the fuel in the combustion chamber	ensure the needle valve is flushed clean during each injection	prevent combustion gas blowback into the open needle valve	prevent reflected pressure waves when the needle valve closes	

14	143	A	The output pressure of a diesel engine lube oil pump is regulated by a/an _____.	relief valve	metering valve	variable speed pump drive	orifice in the lube oil header	
14	144	C	Automatic combustion control systems for some auxiliary boilers are designed to cycle burners on in response to _____.	low fuel pressure	fuel return pressure	low steam pressure	furnace air pressure	
14	145	C	The overspeeding of the diesel engine driving an electric generator could cause _____.	low voltage trip to trip	reverse power trip to trip	damage to windings	excessive exhaust temperatures	
14	146	C	An increase in the air inlet manifold pressure of a diesel engine will result in a/an _____.	decrease in maximum cylinder pressure	increase in ignition lag	decrease in fuel consumption per horsepower-hour	decrease in exhaust manifold pressure	
14	147	B	It is desirable for an auxiliary boiler safety valve to pop open and reseat quickly to _____.	give warning that excessive boiler pressure has been reached	prevent wire drawing of the disc and seat	prevent valve pounding	provide sufficient blowdown	
14	148	C	Coast Guard Regulation (46 CFR) requires that after undergoing extensive repairs, an auxiliary boiler, with a maximum allowable working pressure of 60 psig (411.89 kPa), should be hydrostatically tested at a pressure of _____.	75 psig (514.86 kPa)	80 psig (549.18 kPa)	90 psig (617.83 kPa)	120 psig (823.77 kPa)	
14	149	B	The purpose of the programmed purge cycle on an automatically fired auxiliary boiler is to _____.	cool the furnace to prevent preignition	remove explosive vapors from the furnace	evaporate accumulated unburned fuel oil	provide sufficient air in the furnace to allow ignition of the fuel	
14	150	D	An auxiliary boiler equipped with a return flow fuel atomization system, has a _____.	constant fuel combustion rate	constant fuel return pressure	variable fuel supply temperature	variable fuel return pressure	
14	151	C	The leveling plates in a Kingsbury thrust bearing are held in position by _____.	lock wires	buttons or pivots	dowels and pins	pivoted segments	
14	152	A	For a continuous operation diesel engine, a duplex filter unit would be the best arrangement because _____.	changing filter elements would not interrupt engine operation	filtering occurs twice in each pass of oil through the system	clogging will not occur	dropping pressure is half of that through a single filter unit	
14	153	C	Which of the following devices controls the discharge flow rate of an attached, positive displacement, rotary gear, diesel engine, lube oil pump?	A pressure regulating valve	A pressure relief valve	The engine speed	An orifice	
14	154	D	The expansion tank for a diesel engine closed cooling system is designed to maintain a constant head on the system and _____.	reduce water temperature	reduce water turbulence	provide an air cushion	allow for an increase in water volume as the engine warms up	
14	155	D	The line "bb" shown in the illustration represents the signal from the throttle. Which of the following statements describes how the output of device "A" is able to transform the signal?	The transformation of the signal takes place as the check valve ball dithers in its annular space to continuously develop downstream changes.	Throttle signal transformations occur during transient conditions as the medium flows through device "A".	Design charateristics of the emergency control air supply will only permit regulated blending of the two signals.	The output of device "A", under specific conditions, blocks the output signal from the throttle, and in practice becomes the controlling signal.	See illustration number(s): MO-0118
14	156	B	From the engine data given in the illustration, what is the full load air manifold pressure?	7.66 psi	15.22 psi	45.70 psi	50.00 psi	See illustration number(s): MO-0004

14	157	C	Which of the following statements describes the action of the reversing unit shown in the illustration?	The linearly measured movement of the camshaft is equal to the movement of the control piston.	The pneumatic forces required to operate the device are dependent upon the speed of the engine.	The horizontal movement of the piston is transmitted by levers to the camshafts, with the control piston movement being horizontally greater than the camshaft movement.	The reversing unit is always used in conjunction with a controllable pitch propeller, permitting greater astern power than the sole use of a controllable pitch propeller.	See illustration number(s): MO-0125
14	158	C	Line "P" in the illustration is the _____.	exponential line	line of maximum horsepower	propeller curve	line of maximum efficiency	See illustration number(s): MO-0126
14	159	D	Why are heavy fuels not usually prone to the problems of microbiological infection?	Heavy fuels are subjected to better refining processes which prevent the formation of these growths.	Most heavy fuels contain chemicals which prevent the growth of fungi and other bacteria.	Microbiological infection does not affect marine fuel but rather the personnel who are involved with the handling, storage and purification of the fuel.	The necessary nutrients that the organisms feed on are in a more complex form and not available for microbial degradation.	
14	160	D	Heavy soot accumulations in an auxiliary boiler could be caused by _____.	water in the fuel oil	excessive cycling	high fuel oil pressure	improper burner maintenance	
14	161	B	The bearing shown in the illustration is designed to carry thrust when applied _____.	left to right only	right to left only	in either direction	the bearing pictured is not designed to carry thrust	See illustration number(s): MO-0001
14	162	D	To minimize corrosion, fuel oil strainer disks, spacers and scraper blades are made of _____.	brass	copper	iron	monel metal or stainless steel	
14	163	D	In a diesel engine, maximum lube oil system pressure is normally controlled by _____.	the capacity of the lube oil pump	the speed of the lube oil pump	the outlet pressure of the lube oil pump	a relief valve	
14	164	D	Which of the following statements describes the function of an expansion tank in a diesel engine cooling system?	Maintains a constant head on the system.	Reduces the likelihood of air or steam pockets formation.	Provides a low pressure point for the addition of makeup cooling water.	All of the above.	
14	165	A	Prior to lighting off a cold automatically fired auxiliary boiler, you should _____.	check and regulate the water level	close the air cock once fires are lit	blowdown the gage glass	crack the steam stop to assure protective steam flow	
14	166	A	Within the cycle of a forced circulation auxiliary water-tube boiler, part of the water flashes into steam, and the remaining hot water is _____.	collected in the lower portion of the steam accumulator for recirculation back to the heating coil or water tank	returned to the lower drum via downcomers due to density difference for reheating	passes through the domestic heating system return line steam traps to the auxiliary feed supply tank	automatically dumped into auxiliary feed heater and reheated by auxiliary exhaust back pressure	
14	167	A	Ignition failure in an automatically controlled auxiliary boiler could be caused by _____.	carbon deposits on the flame scanner	high fuel oil temperature	low fuel oil viscosity	high steam pressure	
14	168	A	Device "27" shown in the illustration is used to _____.	seal the shell when raising vacuum	purge the unit of non-condensable gases	relieve excess pressure	add de-scaling chemicals as needed	See illustration number(s): MO-0111
14	169	A	In a coil-type auxiliary water-tube circulation boiler _____.	unevaporated feedwater collects in the bottom of the flash chamber	all generated steam is recirculated through heating coils in the boiler	heated water flashes to steam in the boiler heating coils	response to steam demand is slower than in a fire-tube boiler	
14	170	B	One method of constructing large marine diesel engines and reducing the total engine frame weight is through _____.	casting interlocking components	welding plates to form sections for assembly	forging integral components	case hardening integral components	

14	171	B	On a large diesel engine installation, crankshaft axial alignment is maintained by the _____.	piston rod guides	engine thrust bearing	crosshead bearing	main shaft flexible coupling	
14	172	A	Regarding the fuel injector shown in the illustration, the purpose of piece No. 38 is to _____.	filter the fuel	maintain fuel pressure at a preset level	adjust the fuel rack spring tension	relieve excess fuel pressure to the suction side of the pump	See illustration number(s): MO-0059
14	173	C	Which of the following statements is true concerning an oil cooler?	The oil temperature is less than the cooling water temperature.	The oil pressure is less than the cooling water pressure.	The oil pressure is greater than the cooling water pressure.	The oil flow control valve is always installed in the oil input line	
14	174	A	The device allowing for the change in volume of the cooling water in a propulsion diesel engine closed cooling system is the _____.	fresh water expansion tank	sea water expansion tank	thermostatic expansion valve	jacket water cooler accumulator	
14	175	C	The pneumatic circuit shown in the illustration is part of a control system used with large low speed diesel engines. The arrangement may be used to control _____.	bridge tachometer variations	the proportional offset of the throttle signal	main engine speed	emergency clutching operations	See illustration number(s): MO-0118
14	176	A	Scavenging in a four-stroke/cycle diesel engine occurs during the _____.	last part of the exhaust stroke, and the first part of the intake stroke	last part of the intake stroke only	early part of the injection stroke only	early part of the power stroke	
14	177	C	Which of the following conditions would NOT be considered as a reason for the diesel engine to operate in the area indicated by letter "B" shown in the illustration?	Operation of vessel in shallow water	Incorrect fuel pump settings	Minimal marine growth on hull	Damaged propeller blades and hub	See illustration number(s): MO-0126
14	178	D	A dirty atomizer sprayer plate in the burner of an auxiliary boiler, would be indicated by _____.	carbon on the register doors	a dazzling white atomizer flame	fluctuating pressure in the windbox	an unevenly shaped burner flame	
14	179	A	The color of the exhaust from a diesel engine should be _____.	clear	hazy light brown	hazy light blue	hazy light grey	
14	180	B	Which of the following actions takes place in the control circuit of an automatically fired auxiliary boiler when the desired steam pressure is obtained?	A temperature sensing device opens the circuit breaker in the burner motor.	The high limit control secures power to the entire oil firing system.	The stack relay actuates the low limit control which breaks the ignition circuit.	The stack relay secures power to the high voltage side of the ignition transformer.	
14	181	D	In a large, slow-speed, main propulsion diesel engine, which of the parts listed is under tension when the engine is running?	Bed plate	Column	Entablature	Tie rod	
14	182	A	Coast Guard Regulations regarding diesel fuel oil systems, valves for removing water or impurities are _____.	permitted, provided they are fitted with caps or plugs	required, if there are no separators installed on board	not required, provided there is a high and low tank suction	strictly prohibited	
14	183	A	The lube oil cooler is located after the lube oil filter in order for _____.	the filter to operate more efficiently	the lube oil cooler to be bypassed	positive lube oil pump suction to be assured	galvanic action in the cooler to be minimized	
14	184	D	The highest pressure in any closed diesel engine freshwater cooling system is at the _____.	jacket water outlet	expansion tank inlet	heat exchanger inlet	cooling water pump outlet	
14	185	D	What is the primary purpose of the pneumatic component shown in the illustration?	The valve with finite positioning is used to segregate terminal signals originated by the governor whenever the throttle is repositioned.	The indicated valve prevents transmission of transient signals to the governor speeder spring.	If the locking handle is in any position other than "zero", the output of the pneumatic valve will equal the input.	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.	See illustration number(s): MO-0119
14	186	B	Air scavenging of the cylinder shown in the illustration, begins between figures _____.	2 and 3	3 and 4	4 and 5	5 and 6	See illustration number(s): MO-0025

14	187	C	The diagram shown in the illustration may be used to determine the proper operation of the engine. Which of the following statements represents an accurate interpretation of the diagram?	The engine may be operated in any area of the diagram provided steps are taken to reposition the load indicator.	Operation within area "B" is permitted for extended time periods provided no changes are made to the air intake system.	Ideally the engine should be operated in area "A", however, it is permissible to intermittently operate the engine in area "B".	Assuming the load indicator reads 90% and the engine speed is at 80% the engine can be operated until maintenance requirements become apparent.	See illustration number(s): MO-0126
14	188	B	Concerning diesel propelled vessels, the astern power is to provide for continuous operation astern _____.	equal to that available for ahead operation	at 70 percent of the ahead rpm at rated speed	while underway and under all normal conditions	at 70 percent of the ahead rpm of average continous sea speed	
14	189	A	Throttling a burner air register on an auxiliary boiler could result in _____.	smoky boiler operation	decreased fuel consumption	improved fuel combustion	fewer soot deposits	
14	190	D	A burner producing black smoke in an automatic auxiliary boiler, would be caused by a/an _____.	incorrect electrode setting	defective solenoid valve	grounded high tension lead	incorrect primary air setting	
14	191	B	In the large, slow-speed diesel engine frame shown in the illustration, firing forces are absorbed by the _____,	crosshead guide rails	tie rods	entablature	column	See illustration number(s): MO-0002
14	192	A	The main advantage of unit injectors over other fuel injection systems is _____.	the lack of high pressure fuel lines	their relatively low injection pressures	reduced wear of spray orifices	the lessened chance of fuel leaks into the engine sump	
14	193	D	Which action should be taken when an auxiliary boiler in is operation?	Clean all electrical connections.	Lift the relief valves by hand.	Inspect and clean all solenoid valves.	Inspect for oil and water leaks.	
14	194	A	Failure of the burner flame in an automatic auxiliary boiler would probably be a result of _____.	water in the fuel oil	broken high tension leads	incorrect electrode setting	full fuel pressure at the nozzle	
14	195	B	If the flame of an automatically fired auxiliary boiler tends to move away from the burner tip when the firing rate is changed from low to high, you should _____.	decrease the fuel pressure	adjust damper linkage to slow the opening rate of the dampers	adjust damper linkage to lengthen the purge period	adjust the photocell to observe the new flame position	
14	196	B	In a two-stroke/cycle diesel engine, the process of scavenging begins as the _____.	piston nears and passes TDC	latter part of the downstroke	piston passes BDC	early part of the downstroke	
14	197	D	Which of the following procedures decreases the total dissolved solids concentration in the water of an auxiliary boiler?	Hydrazine treatment of condensate	Frequent compounding	Chemical cleaning	Bottom blowing	
14	198	B	If the fire goes out in an automatically fired auxiliary boiler and the burner continues to supply fuel, there is a potential danger of _____.	overpressure and dry firing	a severe furnace explosion	spalling damage to the brickwork	heat damage to the atomizer	
14	199	D	Improper maintenance of an automatic auxiliary boiler oil burner could result in _____.	fuel pump failure	fan motor failure	increased feedwater consumption	decreased boiler efficiency	
14	200	C	The bearings used to support the crankshaft are generally called _____.	line shaft bearings	connecting rod bearings	main bearings	support bearings	
14	201	B	In the diesel engine illustrated, what part is under compression when firing is taking place in a particular cylinder?	Tie rod	Piston rod	Piston rod nut	Lubrication telescopes	See illustration number(s): MO-0003
14	202	B	Which of the fuel systems listed combines the injection pump and the injection nozzle in one housing?	Common rail	Unit injector	Air injection	Hydraulic governing	
14	203	D	With respect to the flow of lubricating oil through a diesel engine, the lube oil coolers are located after filters in order to _____.	allow filtration of less viscous oil	decrease the pressure drop across the filter	improve overall filtration	all of the above	
14	204	D	In any diesel engine closed freshwater cooling system, the lowest pressure exists at the _____.	jacket water outlet	cooling water pump outlet	heat exchanger outlet	expansion tank atmospheric vent	

14	205	C	The vessel is propelled by a large, low speed, diesel engine, and it is discovered during the starting procedures that there is an insufficient amount of air pressure available to the pneumatic controls. Which of the following statements represents the probable cause for this condition?	The circuit breakers for the starting air compressors have been opened.	The operator of the engine has failed to reopen the main air start valve.	The air supply may be interrupted due to the incorrect position of the fuel control lever.	The throttle is set too high for starting purposes, causing the spring positioned overide interlock to admit control air to the engine cutout device.	See illustration number(s): MO-0119
14	206	C	Maintaining the lowest possible scavenging air temperature at all times is not recommended due to the possibility of the _____.	air charge density becoming too high	piston crown surfaces becoming too cold	formation of excessive quantities of condensate	compression pressure being greatly reduced	
14	207	D	Which of the following conditions will cause the engine to operate in area "A" of the diagram shown in the illustration?	Fouled hull	Inclement weather	Damaged propeller blades	None of the above	See illustration number(s): MO-0126
14	208	C	The nuts of main bearings, connecting rod bolts and all other moving parts are to be secured by _____.	hardened steel nut locks	cotter pins made of spring steel	split pins or other effective means	hydraulic nuts as commonly found on large low speed engines	
14	209	D	Most type(s) of microbiological growths in fuel are _____.	bacteria	fungi	yeasts	All of the above	
14	210	D	In accordance with Coast Guard Regulations (46 CFR), water level controls utilized in a small automatically fired auxiliary heating boiler, shall be tested _____.	by simulation only to prevent possible boiler damage due to a low water condition	every time the boiler is lit off after an extended lay up period	with a stop watch to verify shutdown times	by slowly lowering the boiler water level	
14	211	A	After a normal, or safety shutdown, automatic combustion control systems for an auxiliary boiler are designed to prevent the immediate refiring of a burner in order for the _____.	furnace to be repurged	electric charge to buildup in the igniter	fuel pump to restart	drum level to stabilize	
14	212	C	In a unit injector, an upper helix and lower helix are machined in the lower part of the plunger for _____.	facilitating plunger rotation	positioning the control sleeve	accurate metering of the fuel oil	eliminating injection lag	
14	213	D	Passages are drilled in the crankshafts of diesel engines to provide lubricating oil to the _____.	main bearings	connecting rod bearings	piston pin bushings	All of the above	
14	214	D	The outlet from an expansion tank of a closed freshwater cooling system should be piped to the _____.	cylinder head water outlet header	cylinder jacket inlet main	heat exchanger inlet connection	jacket water pump suction line	
14	215	C	The governor utilized with the device shown in the illustration has become inoperative while the vessel is underway at sea. Which of the following statements describes what action should be taken?	It is necessary to disconnect the shuttle valve from the throttle lever horizontal bar, in order to effectively jump out the pneumatic engine enable control circuit.	The governor should be replaced with one that has been proven to be useful in isochronous applications.	The engine speed can be controlled using the fuel control lever without changing the position of the maximum fuel stop.	The linkage to the shut down servomotor and the governor output shaft must be disconnected in order to operate the engine via the fuel control lever.	See illustration number(s): MO-0119
14	216	D	The intake valves in a diesel engine are reseated by _____.	cam followers	push rods	combustion gases	valve springs	
14	217	A	Which letter represents the top deck (valve) cover of the engine shown in the illustration?	"A"	"H"	"8"	None of the above are correct.	See illustration number(s): MO-0122
14	218	C	When preparing to light off a cold boiler equipped with a return flow fuel oil system, the recirculating valve directs the flow of oil _____.	directly to the fuel oil heater inlet for further warm-up	back to the fuel oil settler for further filtration	back to the suction side of the service pump	directly to the deep tanks	
14	219	D	Small amounts of moisture are necessary to trigger the growth of microbiological organisms found in some marine fuels. Some sources of water contamination are _____.	tank surface leakage	humidity and condensation	improper tank washing procedures	All of the above	

14	220	D	Which of the following conditions will cause only one of the burner solenoid valves to close on an automatically fired, two burner unit, auxiliary boiler?	Loss of the forced draft fan	Low boiler water level	High boiler water level	A faulty coil in one of the solenoid valves	
14	221	B	The main function of tie rods in the construction of large, low speed diesel engines is to _____.	stiffen the bedplate in way of the main bearings to increase the engine's longitudinal strength	accept most of the tensile loading that results from the firing forces developed during operation	mount the engine frame securely to the hull to prevent shaft coupling misalignment	connect the crosshead solidly to the piston rod	
14	222	A	Which of the listed types of fuel injectors is shown in the illustration?	Unit injector	Reverse scroll	Air injection	Pintle type	See illustration number(s): MO-0059
14	223	D	On most modern diesel engines, the main and connecting rod bearings receive their lubricating oil by _____.	banjo feed	splash feed	gravity feed	pressure feed	
14	224	A	The expansion tank in a diesel engine closed freshwater cooling system is located at _____.	the highest point in the system	the lowest point in the system	or near the floor plate level	or near the tank top level	
14	225	B	The burner assembly on an automatically fired auxiliary boiler fitted with variable capacity, pressure atomizing burners, maintains steam pressure by _____.	cycling on and off	changing fuel oil return pressure	changing the speed of a rotary cup	varying air pressure supplied to the nozzle	
14	226	A	When accumulated carbon at the air inlet ports of a two-stroke/cycle diesel engine is being removed, you should take care to avoid carbon _____.	entering the cylinder	particles becoming lodged under the intake valves	entering the water jacket	particles entering lube oil	
14	227	C	While an auxiliary boiler is operating at design load, which of the following actions will occur if the automatic combustion control system detects a steam pressure drop?	More burners will be lighted off.	The registers will open fully.	The fuel oil valve and air damper will open wider.	The steam flow will be automatically regulated.	
14	228	A	According to Coast Guard Regulations (46 CFR), when an automatically fired boiler has a flameout, which of the following actions should occur FIRST?	The fuel valve should be de-energized.	The purge cycle should begin.	An alarm should ring.	The fuel oil pump should stop.	
14	229	B	A sprayer plate used in a return flow fuel oil atomizer is correctly installed if the oil _____.	passes through the whirling chamber before passing through the tangential slots	passes through the tangential slots before passing through the whirling chamber	leaves the burner as a straight stream until mixed with the primary flow of combustion air	leaves the burner as a straight stream until mixed with the swirling atomizing steam	
14	230	C	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 "____".	E	B	C	D	See illustration number(s): MO-0047
14	231	C	The dashed lines shown in the illustration, labeled "Y", represents the _____.	cooling water lines	telescopic oil lines	tie rods	fuel oil lines	See illustration number(s): MO-0003
14	232	D	A unit type fuel injector is used on a diesel engine to _____.	meter the fuel	produce the proper fuel oil pressure	atomize the fuel	all of the above	
14	233	B	Lubricating systems for diesel engines are usually designed to initially provide lube oil to the engine _____.	camshaft bearings	main bearings	piston crowns	cylinder walls	
14	234	D	What type of bearing is shown in the illustration?	Collar bearing	Kingsbury thrust bearing	Axial/radial bearing	Michell bearing	See illustration number(s): MO-0120
14	235	D	Which of the following represents the diesel engine camshaft shown in the illustration and its relative rotating speed?	"B" is the camshaft and it rotates at one half of the crankshaft speed.	"T" is the camshaft and its speed equals crankshaft speed.	"G" is the main camshaft drive and rotates at crankshaft speed.	"B" is the camshaft and its rpm will match that of the flywheel.	See illustration number(s): MO-0122
14	236	A	If the valve tappets in a diesel engine are set at greater clearances than those specified by the engine manufacturer, those valves will _____.	open late and close early	open late and close late	fail to open when the engine is cold	fail to open at normal operating temperature	

14	237	A	Regarding a Diesel engine crankcase, the general arrangement and installation should preclude the possibility of _____.	free entry of air to the crankcase	water entering the crankcase while engine washdowns are being performed	excessive oil leakage during periods of increased blowby	subcooling internal components	
14	238	A	The growth rate of microbiological organisms as found in some fuel supplies will _____.	increase in direct proportion to an increase in temperature	decrease if bleaches are added to the fuel on a regular basis	remain unchanged provided complete consumption of the fuel occurs monthly	All of the above	
14	239	C	The water in an auxiliary boiler should be chemically tested daily for alkalinity and _____.	soap hardness	nitrogen content	chloride content	dissolved CO2	
14	240	C	The primary function of a flame safeguard system, as used on an automatically fired auxiliary boiler, is to prevent _____.	accidental dry firing and overpressure	uncontrolled fires in the furnace	explosions in the boiler furnace	overheating of the pressure parts	
14	241	B	A diesel engine crankcase ventilation system _____.	prevents spark generation	removes combustible gases	determines the level of combustible gases	provides inert gas generation in crankcase	
14	242	C	Which of the fuel injection systems listed uses a spring loaded differential spray needle valve and an individual pump for each cylinder?	Common-rail injection	Air injection	Jerk pump injection	Distributor injection	
14	243	A	Proper lubrication of the main bearings is more easily obtained in a single acting four-stroke/cycle diesel engine than in a single acting two-stroke/cycle diesel engine because _____.	bearing pressure in a four-stroke/cycle single acting diesel engine is continually reversed	bearing pressure in a two stroke/cycle single acting diesel engine is continually reversed	the maximum bearing pressure is higher in a single acting two-stroke/cycle diesel engine	two-stroke/cycle diesel engines require more complicated lubrication piping	
14	244	D	The interior of some diesel engine saltwater heat exchangers are protected from corrosion by the use of _____.	aluminum plates	lead cathodes	copper baffle plates	sacrificial zincs	
14	245	D	The devices labeled "1" and "2" shown in the illustration are properly termed the _____.	starting gear and shrouding	slinger ring and lip seal	jacking ring and indicator	flywheel and indicator	See illustration number(s): MO-0120
14	246	C	Increasing the valve clearance between a valve stem and rocker arm, will result in the valve _____.	closing later	opening sooner	staying open for a shorter period of time	staying open for a longer period of time	
14	247	D	The diesel engine rocker arms shown in the illustration serve to _____.	open the intake and exhaust valves	operate the exhaust and starting valves	convert rotational energy to reciprocating pressures	open the exhaust valves and operate the unit injectors	See illustration number(s): MO-0122
14	248	B	Internal combustion engine crankcase vent outlets must be equipped with _____.	hinged rain guards	corrosion resistant flame screens	dipsticks for measuring oil levels	crankcase ventilation fans	
14	249	D	The purpose of designing some waste heat boilers with sinuous fire tubes, is to _____.	increase exhaust gas velocity through the boiler	reduce accumulations of carbon deposits on the heat transfer surfaces	eliminate exhaust gas pulsations and noise	increase the rate of heat transfer to the waterside	
14	250	B	The amount of chloride content in the water of an auxiliary boiler can be reduced by _____.	adding hydrazine	blowing down the boiler	adding phenolphthalein	adding a sulfite chloride scavenger	
14	251	B	What function is provided by the crankcase ventilation system on some diesel engines?	Increases the sludge forming tendency of lube oil.	Prevents the accumulation of combustible gases.	Improves lube oil cooling.	Improves cold weather starting.	
14	252	B	Fuel injection pumps using the port and helix metering principle requires the use of a _____.	crosshatched design	lapped plunger and barrel	variable stroke	variable cam lift	
14	253	A	Lubricating oil is supplied to the crankpin bearings in a marine diesel engine by _____.	internal crankshaft passages	immersion in oil	splash lubrication	injection lubrication	
14	254	A	Sacrificial zinc anodes are used on the saltwater side of diesel engine heat exchangers to _____.	reduce electrolytic action on heat exchanger metals	keep heat transfer surfaces shiny and clean	prevent rapid accumulation of marine growth	provide a protective coating on heat exchanger surfaces	

14	255	C	The fuel supply system to an automatic auxiliary boiler, will be automatically shutdown if the boiler _____.	salinity is abnormally high	steam demand is too high	water level is abnormally low	feedwater flow is low	
14	256	B	What is the function of device "B" shown in the illustration?	It serves to heat incoming feedwater.	It condenses the vapors formed in section "G".	It removes sensible heat from the jacket water.	It serves to boil off incoming feedwater.	See illustration number(s): MO-0110
14	257	B	In readying an auxiliary water-tube boiler for a routine hydrostatic test, which of the following procedures should be undertaken prior to filling the boiler with fresh water?	The safety valve escape piping should be disconnected from the valve body and a blank inserted.	The boiler vent valves should be opened.	All handhole/manhole covers should be tightened up as much as possible to preclude any leaks.	All of the above.	
14	258	B	Constant capacity pressure atomizing fuel oil burners installed on automatically fired auxiliary boilers, respond to variations in load demand by _____.	automatically increasing the fuel/air ratio	automatically cycling the burner on and off	responding to the boiler high and low water level limit switches	regulating the fuel oil service pump discharge pressure	
14	259	D	Which of the following conditions could cause the feed pump for an auxiliary boiler to lose suction?	Increased suction head pressure	Decreased feedwater temperature	Pump recirculating line being open too much	Excessive feedwater temperature	
14	260	A	Coast Guard Regulations (46 CFR) specify that the fuel oil ignition system, on a small automatically fired auxiliary boiler, shall be energized _____.	only before, or simultaneously with, the opening of the fuel oil valve	after the fuel oil valve opens	after a prepurge of not less than 10 seconds	before the trial for ignition period	
14	261	C	The crankcases of many diesel engines are kept under a slight vacuum to _____.	improve fuel economy	increase the air charge velocity	reduce the risk of explosion	all of the above	
14	262	C	The rate of cylinder lubricating oil metered to each cylinder of a large, low-speed, main propulsion diesel engine is _____.	the same, whether at sea, or during maneuvering	adjusted during each hour of operation while at constant RPM	higher at sea than while maneuvering	lower at sea than while maneuvering	
14	263	D	On a medium-speed main propulsion diesel engine, the crankpin or crank journal bearings receive lubricating oil from _____.	a spindle lubricator	an oil jet	internal splashing	drilled passages in the crankshaft	
14	264	B	The amount of oil atomized by the return flow variable capacity atomizer, used with some automatically fired boilers, is controlled by the _____.	amount of air admitted to the atomizer	oil pressure in the oil return line	quantity of oil delivered by the service pump	proportioning device in the atomizer fuel valve	
14	265	B	An automatically fired auxiliary boiler is required by Coast Guard Regulations (46 CFR) to be shutdown as a result of _____.	low boiler pressure	low water level	wide flame cone angle	high fuel oil pressure	
14	267	D	Fins are installed on the generating tube surfaces in waste heat boilers to _____.	prevent soot fires in the exhaust system	prevent exhaust gas erosion of the tubes	increase the velocity of exhaust gas flow	increase the rate of heat transfer	
14	268	B	Subtracting the return flow meter reading from the supply flow meter reading on a boiler equipped with a return flow fuel oil system, determines the amount of oil _____.	circulated by the system	burner throughput	returned to the settler	discharged from the pump	
14	269	D	The amount of fuel oil atomized by a return flow oil burner is directly controlled by the _____.	header supply valve	burner root valve	oil micrometer valve	fuel oil back pressure	
14	270	A	In a fire-tube auxiliary boiler, you should expect to find the thickest scale on the waterside of the _____.	crown sheet	through stays	hydrokineter	belly plug	
14	271	D	The crankcase of many diesel engines are kept under a slight vacuum by the _____.	scavenging action of the piston	piston type vacuum pump taking suction off a differential manometer	gland exhausting manometer	crankcase exhaust fan	
14	272	B	Each diesel engine cylinder shown in the illustration is equipped with a/an _____.	unit injector	individual jerk pump and injector	fuel valve supplied from the common rail	fuel valve, spray valve, and flame plate	See illustration number(s): MO-0007
14	273	C	Lubricating oil systems for diesel engine journal bearings are usually lubricated by which of the following types of lubricating oil systems?	Splash	Gravity	Pressure	Bypass	

14	274	C	Which of the listed item numbers represents the bearing surfaces of the bearing shown in the illustration?	"4" and "5"	"6" and "3"	"6" and "13"	"13" and "14"	See illustration number(s): MO-0120
14	275	D	The rocker arms of the diesel engine shown in the illustration are indicated by _____.	"C"	"D"	"B"	"C" and "Y"	See illustration number(s): MO-0122
14	276	C	Which of the following conditions can cause above normal air temperature to develop in the intake manifold of a four-stroke/cycle, turbocharged, diesel engine?	Clogged air intake filters	Piston blow-by	A defective aftercooler	Faulty exhaust valves	
14	277	C	When may the crankcase ventilation pipes or oil drain pipes of two or more engines be connected?	Propulsion engines under 1000 shaft horsepower may share a common crankcase vent provided the oil drains remain separate.	In most cases it is desirable and cost effective for propulsion engines to share a common crankcase ventilation and monitoring system.	No interconnection may be made between the crankcase ventilation pipes or oil drain pipes.	None of the above are correct.	
14	278	C	Which of the following statements describes the unchecked growth of microbiological organisms within a fuel system?	The dying bacteria will cause a coating to be formed on the sides of the tank thereby decreasing corrosion.	The fuel in the tank will loose its fluidity, solidify, and be the cause of an expensive removal process.	Corrosion of various metal components will occur due to the formation of hydrogen sulfide gas.	All of the above are correct.	
14	279	B	If the feed pump for an auxiliary boiler fails to deliver the feed water to the boiler, the cause may be _____.	high steam pressure in the boiler	abnormally high feedwater temperature	abnormally high boiler water temperature	steam demand exceeding feed pump capacity	
14	280	D	When lighting off an auxiliary boiler, which of the problems listed could cause the burners to sputter?	Cold fuel oil	Low fuel oil pressure	Low atomizing steam pressure	Water in the fuel oil	
14	281	D	Which of the following actions should normally be taken during each watch when the auxiliary boiler is in operation?	Clean the flame scanner photocell window.	Inspect and clean all solenoid valves.	Lift the safety valves by hand.	Inspect for oil or water leaks.	
14	282	D	Which of the listed types of fuel injection systems is used in the diesel engine shown in the illustration?	Common rail	Unit	Distributor	Pump controlled (jerk pump)	See illustration number(s): MO-0007
14	283	B	Lubrication for the main reduction gears used with diesel engines is usually supplied by _____.	oil from the main engine sump	an independent lube oil system	the stern bearing head tank	the stern bearing sump tank	
14	284	B	When there is a flame failure in an automatically fired auxiliary boiler, the _____.	air supply is shut off	fuel supply is shut off	water supply is shut off	safety valve lifts	
14	285	B	Excessive vibration of an automatically fired auxiliary boiler can be caused by _____.	air or water in the furnace	combustion pulses	fuel oil pump failure	flame failure	
14	286	D	Cooling the intake air supplied to a diesel engine will _____.	reduce mean effective pressure	decrease average compression pressure	decrease air charge density	increase power output	
14	287	A	Which of the listed items should be secured before performing any maintenance on a solenoid operated air start valve?	Electric power	Lube oil standby pump	Hydraulic switch	Motor drain	
14	288	A	Burner ignition failure in an automatically fired auxiliary boiler would be caused by _____.	a burned out solenoid in the oil supply valve	high temperature excess air	incorrectly setting the hotwell dump valve	an incorrectly positioned burner snubber relay	
14	289	A	The purpose of a temperature sensing device installed in the stack of a small automatically fired auxiliary steam boiler is to secure the oil burner _____.	in the event of a flame failure	in the event of a stack fire	when the water level reaches the crown sheet	when the feed pump discharge pressure drops to a preset minimum	
14	290	B	The water in an auxiliary boiler should be tested for chloride content to determine _____.	total dissolved solids	salt contamination	water hardness	chlorine contamination	
14	291	C	From the engine data given in the illustration, what is the swept volume of any one engine cylinder?	182 cubic inches	2800 cubic inches	4766 cubic inches	5712 cubic inches	See illustration number(s): MO-0004

14	292	B	In the jerk pump shown in the illustration, fuel pressure will be the lowest in piece # _____.	1	5	11	12	See illustration number(s): MO-0060
14	293	D	The bearing shown in the illustration serves to _____.	provide linear motion to the vessel by the conversion of the rotating forces of the engine	prevent angular and offset misalignment due to the inertial forces of the propeller and its associated shafting	reduce resonant frequencies allowing the use of smaller harmonic balancers	transmit the axial thrust of the propeller to the foundation of the vessel via the bed plate	See illustration number(s): MO-0120
14	294	A	Device "E" shown in the illustration is known as the _____.	fuel manifold	injector adjusting link	overspeed trip shaft	extrusion tube assembly	See illustration number(s): MO-0122
14	295	D	What is to be installed on an internal combustion engine if its cylinder bore exceeds eight inches?	Crankcase vapor monitors	Engine exhaust silencers	Constant pressure type turbochargers	Explosion relief valves	
14	297	A	An indication of microbial contamination is _____.	stripping of paint in tanks	reduced corrosion in fuel tanks	usually discovered during normally scheduled strainer cleaning	yellow slime or fibrous sludge	
14	298	D	According to Coast Guard Regulations (46 CFR), the fuel strainer installation located in the supply lines to the fuel pump of an auxiliary boiler, can be provided with _____.	duplex type strainers	single strainers of the self-cleaning type	single strainers fitted with bypasses	all of the above	
14	299	B	Excessive return oil pressure from a variable capacity return flow fuel oil burner system on an automatic auxiliary boiler, will cause _____.	flame failure	burner smoking	ignition failure	burner failure	
14	300	A	The concentration of total dissolved solids in the water of an auxiliary boiler can increase as a result of _____.	seawater contamination	frequent surface blows	dissolved oxygen deaeration	frequent bottom blows	
14	301	B	The camshaft drive is designed to maintain proper camshaft speed relative to crankshaft speed. In maintaining this relationship, the camshaft drive causes the camshaft to rotate at _____.	one-half crankshaft speed in a two-stroke cycle diesel engine	crankshaft speed in a two-stroke cycle diesel engine	two times crankshaft speed in a two-stroke cycle diesel engine	one-fourth times crankshaft speed in a four-stroke cycle diesel engine	
14	303	D	Wristpin bearings are difficult to lubricate because of their oscillating motion and _____.	their free-floating design	their relatively small size	the reciprocating motion of the piston	their position in the lubrication system	
14	304	B	A three-way thermostatic control valve regulates the diesel engine cooling water temperature by passing a portion of the water _____.	around the engine	around the cooler	to the expansion tank	overboard	
14	305	D	According to Coast Guard Regulations (46 CFR), which of the following statements is true concerning the water level indicating devices used with an auxiliary boiler?	The illustrated set up may be used on any steam boiler, for any steam pressure, up to 300 psig (2170 kPa).	The minimum size of the piping connecting the water column to the steam drum is to be 1.5 inches (3.8 cm).	The shut off valves on the boiler drum must be of cast iron.	The shut off valves on the boiler drum must be locked, or sealed open.	See illustration number(s): MO-0093
14	306	A	Automatic burner shutdown in an auxiliary boiler, as a result of a component failure in the flame safeguard controls, will _____.	prevent the boiler from automatically relighting	eliminate the need for furnace purging	cause automatic restart after a purge period	cause an explosion in the boiler furnace	
14	307	A	When an auxiliary boiler is secured and you expect to relight the unit within six hours, you should _____.	maintain a head of steam not less than 10 psig	completely fill the boiler with feedwater	flush the boiler and close the waterside airtight	maintain steam pressure 10 psig below normal boiler load	
14	308	D	If the combustion control system of an automatically fired auxiliary boiler fails to restart from the normal shutdown mode, you should check for _____.	broken or grounded high tension leads	a faulty ignition cable connector	an incorrect electrode setting	all of the above	
14	309	A	Bottom blow valves are installed on auxiliary water-tube boilers to _____.	remove suspended and precipitated solids from the boiler water	completely drain the boiler in an emergency situation	prevent hardened scale deposits in the water drum	remove floating impurities from the oiler water surface	

14	310	D	A sprayer plate marked 32Y20, as used in a return flow fuel oil system, should only be used with a/an _____.	burner tip marked 20	burner tip marked 32	orifice plate marked 20	orifice plate marked 32	
14	311	A	If the speed of the propeller is 135 RPM, the speed of the engine camshaft shown in the illustration will be _____.	135 RPM	270 RPM	variable depending on the camshaft gear train gear ratios	variable depending on the ratio between engine rpm and propeller shaft rpm	See illustration number(s): MO-0003
14	312	D	The purpose of piece #7 in the jerk pump shown in the illustration is to _____.	lock the fuel inlet connection into the pump housing	position the control rack while calibrating the pump	prevent the barrel piece #26 from rotating in the housing	bleed air from the pump and fuel lines	See illustration number(s): MO-0060
14	313	D	Mechanical lubricators for diesel engine cylinders are usually small reciprocating pumps which are _____.	operated manually once each hour	operated until the engine has started	placed into operation only at maximum load	adjustable to meet lubrication requirements	
14	314	B	In a diesel engine closed freshwater cooling system, the amount of coolant flowing through the heat exchanger is controlled by the _____.	suction pressure regulator	thermostatic bypass valve	sea water temperature	water level in the expansion tank	
14	315	D	How is lubrication provided to the device shown in the illustration?	A separate system containing oil under extremely high pressure is used due to its ability to provide a high film strength.	Only silicate ester based synthetic oils have the capability and necessary characteristics to be used in this type of application.	The lubrication system closely resembles the system used with standard shaft bearings.	The lube oil enters through the supply pipes shown and eventually drains to the main engine sump.	See illustration number(s): MO-0120
14	316	B	Which of the following conditions is indicated by the presence of water in the scavenging air receiver?	Leaking cylinder head gaskets	Leaking aftercooler	Excessively high scavenge air temperature	Auxiliary blower failure	
14	317	C	Component "F" shown in the illustration is called the _____.	camshaft adjusting screw	permadjust assembly	injector control shaft	cylinder head locking device	See illustration number(s): MO-0122
14	318	A	Crankcase explosion relief valves should be of the _____.	return seating type	spring centered type	spring opened type	duplex double acting type	
14	319	D	Which of the following conditions is NOT an indication of microbial contamination of the fuel supply?	Evidence of corrosion	Pitting of metal surfaces	Presence of green slime	Brightening of copper bearing metals	
14	320	C	The opening of an exhaust valve on a modern, large, low- speed, main propulsion diesel engine, may be actuated by _____.	direct action of cam shaft	compressed air pressure	hydraulic "push rods"	direct action of the main piston moving down	
14	321	B	The speed of the camshaft in a two-stroke/cycle diesel engine, running at 950 RPM, is _____.	475 RPM	950 RPM	1900 RPM	2400 RPM	
14	322	D	Which of the following statements represents the function of the plunger flange shown in the illustration?	It limits the actual stroke of the plunger.	It takes the plunger off stroke when injection is completed.	It prevents the plunger from rotating in the barrel.	It transmits the control rack setting to the plunger.	See illustration number(s): MO-0061
14	323	B	Cylinder lubrication oil for low speed main propulsion diesel engines is admitted to each cylinder during _____.	the power stroke	the compression stroke	low load operation only	periods of standby	
14	324	D	Temperature control valves installed in the jacket cooling water system of a diesel engine, modulates the rate of water flow through the _____.	cooling water pump	nozzle cooling passages	cylinder jackets	heat exchanger	
14	325	B	In comparison to straight flow mechanical atomizers, return flow atomizers provide relatively uniform atomization over a wide firing range due to the _____.	back pressure regulation resulting in more complete combustion at high firing rates	oil supply pressure not having to be reduced at low loads to the point where poor atomization occurs	return flow atomizer being designed for best combustion at low firing rates	rotational motion imparted by the tangential slots being greater in the return flow atomizer	
14	326	A	A restricted air intake to a diesel engine may result in the engine _____.	failing to reach rated speed	knocking under maximum load	hunting or surging under light load	overspeeding and running away	

14	327	C	What prevents the thrust bearing blocks shown in the illustration from rotating within the housing?	The bearing blocks are massive and their weight provides sufficient force to prevent rotation.	The thrust shoes of a Kingsbury thrust bearing are held in place by pins.	Found within the thrust bearing cap or cover are extended protrusions to position the segments and maintain minimum clearance.	The bearing assembly is specifically designed to allow for rotation, permitting the transmittal of axial forces across a greater surface area and minimizing loading densities.	See illustration number(s): MO-0120
14	328	D	The injector rack of the diesel engine shown in the illustration is indicated by the component labeled _____.	"B"	"E"	"F"	"G"	See illustration number(s): MO-0122
14	329	B	Explosion relief valves on diesel engine crankcases should relieve the pressure at not more than _____.	0.1 bar	0.2 bar	1.0 bar	2.0 bar	
14	330	B	Which of the following conditions is NOT an indication of microbial contamination?	Objectionable odors	Increased air filter changes	Occurrences of flow restrictions	Increased corrosion of tank plating	
14	331	B	In a four-stroke/cycle diesel engine, the camshaft rotates at _____.	twice the crankshaft speed	half the crankshaft speed	the same speed as the crankshaft	a speed independent of the crankshaft	
14	332	A	What is the purpose of the "window" installed in the housing of an individual jerk pump?	To allow the pump to be timed to the engine.	To check for sludge on the pump barrel.	To check that fuel oil return passages are clear.	To set up the fuel rack calibration in cubic millimeters.	
14	333	A	For diesel engine piston cooling, lubricating oil can be supplied to the pistons by a/an _____.	oil spray	oil bath	oil control rings	drilled passage through the camshaft	
14	334	D	The jacket water temperature in a diesel engine closed freshwater cooling system is normally controlled by _____.	regulating the level of corrosion inhibitor in the primary cooling system	the level of the freshwater expansion tank	varying the engine load to meet temperature requirements	the operation of the thermostatic valve	
14	335	C	Variations in the amount of fuel oil burned in a return flow type burner, are controlled by the _____.	atomizing steam pressure	size of the whirling chamber	back pressure in the fuel oil return line	area of the tangential slots	
14	336	A	On a turbocharged, medium-speed, diesel engine, which of the following problems is an indication of a restricted air intake passage?	engine is hard to start	engine misses	surges at governed RPM	coolant temperature is too low	
14	337	C	In the water level electrode assembly, shown in the illustration, the leads indicated by letter "F" would be wired to the _____.	modulating pressuretrol	feed pump controller and pyrostat	feed pump controller and burner circuit	burner circuit and feedwater regulator	See illustration number(s): MO-0047
14	338	B	The water in an operating auxiliary boiler should be tested for alkalinity and chloride content each _____.	hour	day	week	month	
14	339	C	Coast Guard Regulations (46 CFR) require that the flame safeguard control system for an automatic boiler, should _____.	be designed to automatically relight the boiler fires after a low water shutdown	incorporate an open bimetallic helix pyrostat stack switch	be capable of closing the fuel valves in not more than 4 seconds after a flame failure	provide a trial for ignition period of not more than 90 seconds	
14	340	B	The closing of the exhaust valves used on a modern, large, low-speed, main propulsion diesel engine may be directly provided by _____.	large conical springs	compressed air pressure	hydraulic pressure	exhaust gas pressure	
14	341	C	In a two-stroke/cycle diesel engine, the camshaft rotates at _____.	twice the crankshaft speed	half the crankshaft speed	the same speed as the crankshaft	a speed independent of the crankshaft	
14	342	C	In the jerk pump shown in the illustration, piece #1 connects directly to the _____.	fuel nozzle	cylinder head	high pressure fuel line	spill port	See illustration number(s): MO-0060
14	343	C	Oil for piston cooling is delivered through the connecting rod to a compartment in the piston head, then distributed as a result of piston motion, and finally drained to the crankcase through one or more holes or pipes. This procedure is known as the _____ .	splash method	spray method	shaker method	throw-off method	

14	344	A	Why do most temperature control valves in diesel engine closed freshwater cooling systems vary the flow of jacket water through the cooler instead of through the engine?	Changing the rate of flow in the jackets could cause localized hot spots.	Emergency hand control would not be possible if water flow through the jackets were controlled.	Excessive cooling would take place in the heat exchangers at high loads.	Excessive cavitation erosion would take place in the coolers.	
14	345	C	Item "7" shown in the illustration is identified as a _____.	magnetic pickup used to sense shaft speed	dip stick	thermometer	shaft deflection indicator	See illustration number(s): MO-0120
14	346	B	An indication of a diesel engine air intake being partially clogged, is _____.	low firing pressure and low exhaust temperatures	low firing pressure and normal exhaust temperatures	high firing pressure and low exhaust temperatures	high firing pressure and high exhaust temperatures	
14	347	D	Which of the components listed is used to control the diesel engine speed shown in the illustration?	"C"	"D"	"E"	"G"	See illustration number(s): MO-0122
14	348	C	An important design characteristic of an explosion relief valve for a diesel engine is the ability to _____.	open slowly to permit a gradual reduction of crankcase pressure	open quickly against crankcase pressure to prevent a possible implosion	close quickly in order to prevent an inrush of air	close slowly to permit proper seating of the valve disc and neoprene sealing surfaces	
14	349	C	Which chemical listed is utilized to prevent and correct most microbial infections occurring within fuel storage systems?	Bleaches	Banalities	Biocides	Benzene additives	
14	350	C	Which of the following statements describes how the fuel oil enters the whirling chambers of the sprayer plates used in a auxiliary boiler return flow fuel oil system?	Through the outer barrel tube.	Through the sprayer plate drilled passages.	Through tangential slots in the sprayer plate.	Through baffles in the orifice plate.	
14	351	B	If a four-stroke/cycle diesel engine is running at 1550 RPM, the speed of the camshaft will be _____.	525 RPM	775 RPM	1550 RPM	1800 RPM	
14	352	A	In the exploded view of the jerk pump shown in the illustration, the purpose of the slot on piece #27 is to _____.	rotate the plunger flange on piece #26	change the total distance traveled by the plunger	align the pump to the control rack	align the plunger within the barrel	See illustration number(s): MO-0060
14	353	D	Shaker, circulation, and spray are the three general methods used in _____.	pre-injection fuel oil treatment	lube oil filtration	lube oil purification	piston cooling	
14	354	C	For proper operation, auxiliary boiler feedwater must have which of the following characteristics?	High oxygen concentration	Low pH	Proper alkalinity	All of the above	
14	355	A	The most common cause of scale formation in an auxiliary boiler is _____.	concentrations of calcium sulfate in the boiler water	fuel oil in the feedwater	improper treatment of the feedwater with calcium sulfate	excessive feedwater alkalinity	
14	356	C	If over a period of weeks the air-box pressure of a turbocharged, diesel engine, operating at full load, appears to be dropping off, the cause can be _____.	open air-box drains	loss of cooling water to the diffuser	gradual fouling of the air filters	improperly timed exhaust valves	
14	357	C	Some automatically fired auxiliary boilers are equipped with the water level electrode assembly shown in the illustration. In this type of water level control, the burner circuit is completed through the _____.	third leg of the water level electrode assembly	ungrounded neutral leg of the control circuit	water in the boiler drum and electrode assembly	magnetic field surrounding the water level electrode assembly	See illustration number(s): MO-0047
14	358	A	Before an auxiliary boiler is shutdown for an extended period of time, the water in the boiler should have a pH value of _____.	10	7	4	1	
14	359	A	Which of the following statements concerning automaticly controlled auxiliary boiler system alarms complies with applicable Coast Guard Regulations (46 CFR)?	Visible indicators require manual resetting.	Audible alarms shall not be silenced manually.	Visible indicators are not required for low water shutdown.	Failure of the flame safety system need not be monitored.	
14	360	B	According to Coast Guard Regulations (46 CFR), which of the following statements is true concerning the water level indicating device for the auxiliary boiler shown in the illustration?	The illustrated arrangement may be used on any steam boiler, for any steam pressure, up to 300 psig.	The minimum size of the piping connecting the water column to the steam drum is to be one inch.	The shutoff valve on the boiler drum must be of cast iron.	A minimum of three test cocks may serve as the primary water level indicator on boilers under 250 psig.	See illustration number(s): MO-0093

14	361	C	The component labeled "H" shown in the illustration is called the _____.	cold start injector	cylinder lubricator	cylinder test valve	precombustion chamber	See illustration number(s): MO-0122
14	362	A	The purpose of the delivery check valve used in a diesel fuel injection jerk pump is to _____.	assist in a quick cutoff of fuel injection	allow oil backflow from the injector to the helix	reduce fuel oil pressure between injection strokes	meter the quantity of fuel delivered	
14	363	B	The method of piston cooling in which oil is delivered through the connecting rod to a compartment within the piston, then distributed by the motion of the pistons, and allowed to drain to the crankcase via one or more holes or pipes, is termed _____.	quaker	shaker	circulation	spray	
14	364	C	How much will the jacket water temperature normally increase between the inlet and outlet of medium or high-speed diesel engines?	1° to 5°F	5° to 10°F	10° to 20°F	25° to 50°F	
14	365	B	The engine block assembly and foundation are located to the right of the thrust collar shown in the illustration. Why is it necessary to provide the clearance indicated at "F1"?	The clearance at "F1" has always been a surreptitious matter to most design engineers and is required for proper astern operation.	The clearance is required to permit axial expansion of the engine crankshaft while permitting proper operation of the thrust bearing.	No clearance is needed; "F1" only indicates the area in which the most rapid wear will occur.	To measure this clearance the engine should be cold, the vessel trimmed down by the stern, and the shaft hydraulically pushed towards the bow.	See illustration number(s): MO-0121
14	366	B	The fuel injector for the diesel engine shown in the illustration, is indicated by the letter _____.	"H"	"I"	"M"	"Z"	See illustration number(s): MO-0122
14	367	D	Which statement regarding the arrangement and location of explosion relief valves used on an internal combustion engines is true_____?	They may be omitted on all engines having a cylinder bore of nine inches or less	They may be omitted provided the engine utilizes a crankcase monitoring system	The type of engine and operating cycle must be considered by the designer	Minimizing the danger from emission of flame is a key consideration	
14	368	D	Proper housekeeping to prevent the formation of microbiological growths within a fuel system includes the prevention of water accumulations and the use of _____.	steam coils	fuel oil centrifuges	fuel oil discharge filters	chemical additives called biocides	
14	369	A	Excessive alkalinity of the water in an auxiliary boiler can cause _____.	caustic embrittlement of the boiler metal	acidic corrosion of the boiler metal	hard scale deposits on the boiler tubes	etching of the heat exchange surfaces	
14	370	A	Two solenoid control valves are required on large automatic auxiliary boilers, and will simultaneously shut off the fuel in the event of _____.	low water	low steam pressure	high voltage	all of the above	
14	371	C	Diesel engine waste heat boiler construction is usually of the fire-tube or _____.	cyclone furnace boiler type	dry back boiler type	water-tube type	critical circulation boiler type	
14	372	B	The procedures recommended for auxiliary boilers having high salinity include _____.	treating with oxygen scavengers	securing the boiler and giving it a bottom blow	increasing the pH	reducing the phosphate level	
14	373	C	The solenoid valves in the fuel oil supply line to an automatically fired auxiliary boiler, are automatically closed by _____.	a decrease in feed temperature	high furnace air pressure	high steam pressure	low steam pressure	
14	374	C	Which of the following conditions may need to be reduced when operating a large, low-speed, main propulsion, diesel engine at low loads?	Injection pressures	Control air supply pressure	Cooling water flow through aftercoolers	Lube oil temperature	
14	375	C	In the event of a flame failure in an auxiliary water-tube boiler, you must _____.	relight the boiler immediately to prevent loss of steam pressure	relight the fire off the brickwork as long as the bricks are cherry red	purge the furnace of any combustible gases before attempting to relight the fire	speed up the feed pump to prevent dry firing when the burner flame is reestablished	

14	376	A	If the intake, or exhaust valve stem clearance is found to be excessive, in addition to too little movement of the rocker arms, you should check for _____.	collapsed hydraulic valve lifters	loose valve spring locks	worn valve seats	broken valve springs	
14	377	A	Improper maintenance of the fuel oil burners in an automatically fired auxiliary boiler, could result in _____.	increased fuel consumption	increased feedwater consumption	fuel pump failure	combustion control system failure	
14	378	A	The concentration of dissolved solids in the boiler water of an auxiliary boiler could increase as a result of _____.	phosphate treatment	zero water hardness	dissolved oxygen deaeration	frequent bottom blows	
14	380	C	Failure of the feed pump to deliver feedwater to an auxiliary boiler could be caused by _____.	a low pump suction lift	abnormally low water temperature	grounded probes in the water level control	a high pump suction head	
14	381	D	Why should the main steam stop valve of an auxiliary boiler be eased off its seat and then gently closed before lighting off?	To check the valve packing.	To examine the valve stem for scars or nicks.	To check for a tight bonnet seal.	To ensure that the valve will not be seized shut when hot.	
14	382	B	One function of the fuel pump delivery check valve is to _____.	prevent carbon deposits from forming on the injector nozzle	help the injector needle reseat without dribbling at the nozzle holes	provide a prolonged pressure drop in the high pressure steel piping to the injector	ensure a fuel leakoff between the plunger and barrel which provides lubrication for relative movement	
14	383	B	For any piston ring to operate smoothly without scuffing, the ring must be _____.	of a material harder than the cylinder liner	properly lubricated	prevented from compressing	prevented from rotating during engine operation	
14	384	B	Using a cooling water temperature of 225°F (107.2°C), instead of 180°F (82.2°C) in an auxiliary diesel engine, will _____.	reduce the probability of scale formation in the jacket cooling passages	reduce the opportunity for the formation of sulfuric acid in the cylinder bore exhaust passages	allow for smaller water passages within the engine	increase fuel consumption per horsepower hour	
14	385	D	After following the prescribed procedures to measure the thrust bearing clearance shown in the illustration, the distance "f" is determined to be 200 mm, and "f1" is 2.3 mm. Which of the following statements describes the condition indicated by these dimensions?	The total active thrust area is 202.3 mm, well within the standards set forth by the GSMA (German Society for Machining Accuracy).	The loading ratio, or shaft diameter divided by collar surface area is within 2.7 : 1.	These dimensions indicate the presence of flourishing marks on the thrust shoes; the marks becoming visible as the distance at "f1" increases.	It is possible for the shaft to move axially 2.3 mm during astern operation and relates to an excess movement of 1.3 mm, 0.3 mm beyond the maximum worn play.	See illustration number(s): MO-0121
14	387	C	Flame failure in an automatically fired auxiliary boiler can result from a/an _____.	incorrect electrode setting	incorrect nozzle position	clogged fuel nozzle	broken high tension lead	
14	388	D	How many crankcase relief valves are required for a 13 inch bore, eight cylinder in-line engine?	2	4	6	8	
14	389	D	If the fuel/air ratio in an automatically fired auxiliary boiler is insufficient, the result could lead to _____.	inefficient combustion	dark smoke	automatic shutdown	all of the above	
14	390	B	Which of the following actions should normally be taken during each watch when the auxiliary boiler is in operation?	Clean all duplex oil strainers	Observe general boiler performance	Lift the safety valves by hand	Inspect and clean burner oil solenoid valves	
14	391	C	Under which of the following conditions must the combustion control system for a small automatic auxiliary boiler secure the burner?	High water level	Low steam pressure	Flame failure	High fuel oil temperature	
14	392	B	The primary function of a fuel delivery check valve assembly is to _____.	deliver proper fuel quantity to the injection nozzle	provide rapid fuel injection cutoff	control fuel quantity entering the pump body	control fuel pressure delivered to the combustion chamber	
14	393	A	The upper piston rings in large, slow-speed, two-stroke/ cycle diesel engines are most effectively lubricated by oil _____.	fed from mechanical lubricators	thrown off from the main bearings	supplied from wick fed drip lubricators	flow from a centrifugal or banjo oiler	

14	394	A	Operating a diesel engine for prolonged periods, with a closed freshwater cooling system, at temperatures lower than the normal design temperature can cause _____.	the formation of sulfuric acid	a decrease in lube oil viscosity	a decrease in cooling water pH	a thermostat failure	
14	395	C	A pulsating flame, accompanied by a burner developing black smoke in an auxiliary boiler, is an indication that the _____.	electrode setting is incorrect	ignition current is too low	fuel oil pressure is too low	fuel nozzle is correctly positioned	
14	396	B	The diesel engine cylinder scavenging system illustrated is an example of _____.	crossflow scavenging	uniflow scavenging	loop scavenging	direct scavenging	See illustration number(s): MO-0071
14	397	D	Which of the following actions should normally be taken during each watch when the auxiliary boiler is operation?	Test boiler water alkalinity	Inspect and clean burner fuel oil solenoid valves	Lift the safety valves by hand	Blowdown the water gage glass	
14	398	D	Flame failure in an operating automatically fired auxiliary boiler can result from a _____.	broken electrode insulator	faulty steam pressure signal to the trial for ignition circuit	broken 2000 volt supply lead	clogged fuel nozzle	
14	399	B	A failure of any component of a flame safeguard control for an auxiliary boiler will result in _____.	a furnace explosion	automatic burner shutdown	uncontrolled firing	automatic restart	
14	400	C	The daily inspection of an operating auxiliary boiler should include _____.	lifting of all safety valves	an examination of the boiler firesides	checking for external fuel and water leaks	measuring steam quality	
14	401	C	The camshafts on the engine, shown in the illustration, operate at a speed equal to _____.	twice the crankshaft speed	the crankshaft speed	one-half of the crankshaft speed	proportionate to the crankshaft speed	See illustration number(s): MO-0005
14	402	C	Where is the fuel delivery check valve located in a jerk pump fuel injection system?	In the cylinder head	On the suction side of the delivery pump	In the injection pump housing discharge	On the inlet side of the spray valves	
14	403	A	The thrust bearing shown in the illustration has over eight years of ahead running time. Measurements show "i1" is 4 mm and "i2" is 1mm. Which of the following conditions is indicated and what steps should be taken, if any?	No appreciable wear has occured, and the proper maintenance procedures should continue to be followed.	A wear rate of 1.6 mm per year occurred. Although not excessive, this condition may require more frequent monitoring.	The stops in which the thrust bearing block rides are worn, and it is necessary to return these to their original specifications.	A wear rate of 1.6 mm per year is excessive and requires immediate assistance from the manufacturer's field support.	See illustration number(s): MO-0121
14	404	C	As a general rule, the recommended operating water jacket outlet temperature range for medium and high speed marine diesels with closed cooling systems is _____.	120° to 139°F	140° to 159°F	160° to 179°F	180° to 199°F	
14	405	C	Which of the fuel injectors listed is installed in the diesel engine shown in the illustration?	Solid jerk	Air Assisted	Unit	Rail	See illustration number(s): MO-0122
14	406	C	The method of scavenging used in the diesel engine, shown in the illustration, is known as _____.	uniflow scavenging	inertia scavenging	loop scavenging	central scavenging	See illustration number(s): MO-0003
14	407	B	What is the primary function of item "15" shown in the illustration?	It removes the vapor condensed in area "23".	It removes the distillate condensed in area "24".	It is the chemical cleaning pump used in conjunction with valve "12".	It is used to empty the evaporator section when there is tube leakage while the unit is secured.	See illustration number(s): MO-0111
14	408	C	If a tube ruptures in a water-tube auxiliary boiler due to low water, you should _____.	secure the fires and maintain feedwater to boiler to keep up the water level	not secure the fires until water level falls out of sight in the gage glass	secure both the fires and the feed inlet valve	secure the fires when the pressure drops to 50% of the maximum allowable working pressure	
14	409	B	An automatically fired auxiliary boiler with carbon deposits formed on its burner electrodes, will experience _____.	flame failure	ignition failure	panting of the furnace	sputtering of the burner flame	

14	410	D	An exhaust gas bypass is installed on a waste heat boiler in order to _____.	bypass exhaust gas at high loads to prevent excessive back pressure	bypass a portion of the exhaust gas at peak loads for better efficiency	recycle exhaust gas to the turbocharger	minimize moisture condensation in the boiler gas passages at low loads	
14	411	B	The RPM of "A" is 100 and hobbed with 80 teeth. If gears "B", "C", and "D" have 62, 20, and 38 teeth respectively, the RPM of "D" in the gear train illustration is _____.	67.91 RPM	652.63 RPM	505.79 RPM	52.63 RPM	See illustration number(s): MO-0088
14	412	B	The delivery valve installed in a port and helix fuel injection pump is designed to _____.	maintain constant pressure in the discharge line	maintain a column of fuel in the line	accurately meter the quantity of fuel injected	close with hydraulic action	
14	413	D	The fuel oil supply system to an automatic auxiliary boiler, will automatically shutdown if the boiler _____.	steam demand is high	salinity is high	safety valve simmers	burner flame is extinguished	
14	414	D	A closed freshwater cooling system is commonly used with marine diesel engines because the _____.	need for water treatment is eliminated	cooling water temperature differential is greater	cooling water pumps are directly reversible	jacket water temperature is more easily controlled	
14	415	C	The diesel engine exhaust gas bypass, as fitted with some waste heat boilers, is installed to _____.	prevent engine back pressure at heavy loads	increase total engine efficiency at low loads	prevent boiler corrosion at low engine loads	improve engine fuel consumption at any load	
14	416	D	"Loop," "uniflow," "crossflow," and "return-flow" are terms used to describe various types of _____.	control air circuits	supercharging	turbochargers	scavenging	
14	417	A	Oxygen corrosion in auxiliary boilers is prevented by treating the boiler feed tank with either sodium _____.	sulfite or hydrazine	sulfite or hygroscopic sulfite	bromide or hydrazine	bromide or hygroscopic sulfite	
14	418	A	Coast Guard Regulations (46 CFR) require a trial for ignition period must not exceed _____.	15 seconds	30 seconds	60 seconds	90 seconds	
14	419	A	A bypass line provided around a waste heat auxiliary boiler in a diesel engine exhaust system, may be used to avoid boiler _____.	corrosion at low engine loads	erosion at high engine loads	overload at high engine loads	scaling at all exhaust temperatures	
14	420	A	The concentration of total dissolved solids in the water of an auxiliary boiler can increase as a result of _____.	seawater contamination	frequent surface blows	dissolved oxygen deaeration	frequent bottom blows	
14	421	B	In the auxiliary diesel engine, shown in the illustration, the _____.	camshaft rotates at the same speed as the crankshaft	governor is linked to the fuel injection pump by vertical linkage	explosion relief doors are clearly visible on both sides of the crankcase	engine oil filter is outboard of the electric starter	See illustration number(s): MO-0006
14	422	C	The jerk pump delivery check valve pump shown in the illustration, is closed by _____.	hydraulic action	fuel pressure	spring #14	cam action	See illustration number(s): MO-0060
14	423	B	Which of the listed sequence of events occurs when an automatic auxiliary boiler is prepurged?	The damper on the inlet side of the furnace is moved to the open position for a given number of seconds and then moved to the closed position.	The damper on the inlet side of the furnace is moved to the open position for a given number of seconds and then moved to the low fire position.	The damper is moved to the closed position for a given number of seconds and then moved to the low fire position.	The damper in the uptakes is moved to the wide open position for a given number of seconds and then moved to the low firing rate position.	
14	424	C	High stack temperature occurring in an auxiliary boiler could be a result of _____.	insufficient air for combustion	complete combustion in the furnace	secondary combustion in the uptake	high fuel oil temperature	
14	425	D	A firebox explosion in an automatically fired auxiliary boiler may be the result of _____.	excessive purging before lighting off	insufficient trail for ignition period	a faulty transformer in the ignition circuit	insufficient purging before lighting off	
14	426	A	The principal difference between loop scavenging and crossflow scavenging, as used in single acting diesel engines, is the _____.	direction of air flow within the cylinder	sequence of port opening	method of opening exhaust ports	volume of air admitted to the cylinder	

14	427	D	What is the normal bearing clearance permitted at the horizontal axis of the shaft for the bearing shown in the illustration?	The tolerances established are dependent on machining processes used and will vary amongst manufacturers.	The clearance on one side of the shaft at the axis will be one twentieth of a millimeter.	The clearance is determined by the thickness of the hydrodynamic wedge formed and is not usually measured while underway.	The normal play on both sides of the shaft will be one tenth of a millimeter.	See illustration number(s): MO-0121
14	428	C	Which letter represents the entrance point for combustion air to the cylinders of the engine shown in the illustration?	"D"	"J"	"K"	"N"	See illustration number(s): MO-0122
14	429	B	An inline engine having a nine inch bore and more than eight cylinders will _____.	incorporate the use of two explosion relief valves	have three explosion relief valves	have at least eight explosion relief valves	not be required to have explosion relief valves	
14	430	C	The PRIMARY function of a waste heat boiler is to _____.	reduce engine exhaust noise	reduce engine back pressure	recover heat which otherwise would be lost	increase turbocharger efficiency	
14	431	A	The speed of the diesel engine camshaft shown in the illustration would be _____.	half that of the crankshaft	twice that of the crankshaft	the same as the crankshaft speed	dependent on the diameter of the lower timing gear	See illustration number(s): MO-0007
14	432	C	Fuel droplets injected into a diesel engine cylinder must have adequate penetration to _____.	prolong the ignition delay period	ensure the beginning of fuel injection	thoroughly utilize the air charge	allow controlled fuel combustion	
14	433	A	A coil-type automatically fired auxiliary boiler is to be laid up wet for an indefinite period. The boiler water should be treated to ensure that _____.	the manufacturer's recommended pH is maintained	there is no excess of oxygen scavenging chemicals	sludge formation cannot occur in the steam separator	waterside blowdown will not be required	
14	434	C	In a diesel engine closed freshwater cooling system where the cooling water pressure drop through the engine is 10 psig, and the pressure drop through the heat exchanger is 4 psig. The cooling water pump must produce a discharge head of at least _____.	4 psig	6 psig	15 psig	28.7 psig	
14	435	A	Coast Guard Regulations (46 CFR) require all automatically fired low pressure heating boilers to have an automatic _____.	fuel cutoff as a result of low water	pressure-control regulator	feedwater control valve	superheat control system	
14	436	C	Collapsed hydraulic valve lifters in a diesel engine will result in _____.	excessive rocker arm movement	little or no valve clearance	excessive valve clearance	collapsed or stacked valve springs	
14	437	C	Large, two-stroke/cycle, main propulsion, diesel engine cylinders can be successfully pressure charged during normal operation, by using the _____.	exhaust gas temperature system	exhaust load system	constant or pulse pressure system	constant volume system	
14	438	B	Control of the fuel oil metering valve in an automatically fired auxiliary boiler is accomplished by a _____.	pressure magnifying device in the steam coil outlet	steam pressure sensing device with linkage to the damper air vanes	metering device in the air supply line	signal from the feedwater electrode	
14	439	D	A safety valve on an auxiliary boiler simmers constantly and can not be stopped by several quick blow-offs using the hand relieving gear. The problem may be _____.	loose dirt on the seat	exposed valve springs	a clogged drain line	a damaged seat	
14	440	B	A burner responsible for producing black smoke in an automatic auxiliary boiler, would be caused by a _____.	defective solenoid valve	dirty fuel nozzle	grounded high tension lead	faulty ignition cable connector	
14	441	A	Which of the following types of feedwater regulators is commonly used with a water-tube, natural circulation, auxiliary boiler?	Thermomechanical	Bimetallic element	Ring thermostat	Modulating pressuretrol	
14	442	C	Fuel injection systems meter fuel, atomize fuel, and _____.	create turbulence in the combustion chamber	aid in completing cylinder scavenging	inject fuel at the proper time	minimize fuel penetration into the cylinder	

14	443	A	A SECONDARY function of a waste heat boiler is to _____.	reduce engine exhaust noise	reduce engine back pressure	increase engine cycle efficiency	increase turbocharger efficiency	
14	444	D	An electric heater built into some smaller diesel engines is used to _____.	raise lube oil viscosity for easier starting in cold weather	increase air inlet temperature	increase compression ratio	increase jacket water temperature for easier starting in cold weather	
14	445	D	What is the maximum allowable clearance permitted between the bearing, shown in the illustration and the shaft along its vertical axis?	1.00 mm	0.30 mm	0.46 mm	0.80 mm	See illustration number(s): MO-0121
14	446	B	Which of the air intake systems listed will result in the lowest specific fuel consumption?	Natural aspiration	Turbocharged	Roots blower	Piston blower	
14	447	D	Which letter represents the exhaust gas exit point for the diesel engine shown in the illustration?	"K"	"J"	"N"	"V"	See illustration number(s): MO-0122
14	448	C	Engines having a bore exceeding 250 mm, but not exceeding 300 mm are to have at least _____.	three compression rings per piston and the minimum of two oil scraper rings	one intake and one exhaust valve per cylinder provided no other means of scavenging is used	one explosion relief valve in way of each alternate crank throw, with a minimum of two valves	one crankshaft except in cases where an opposed piston design is required	
14	449	A	An auxiliary boiler is equipped with a return flow fuel atomization system, which uses a/an _____.	constant fuel supply pressure	constant fuel return pressure	variable fuel supply pressure	all of the above	
14	450	B	Overfiring of a hot water boiler may be caused by _____.	dirty atomizers	faulty limit controls	high water level	flame failure	
14	451	D	What is the speed of the crankshaft in a four-stroke/cycle engine when the camshaft is turning at 750 rpm?	375 RPM	500 RPM	750 RPM	1500 RPM	
14	452	C	In the large slow-speed main propulsion diesel engine shown in the illustration, the part labeled "G" is the _____.	jacket water pump	lube oil pump	fuel oil pump	crankcase exhaust fan	See illustration number(s): MO-0003
14	453	D	The pressuretrol is installed on an auxiliary boiler to sense steam pressure changes, it _____.	controls the flow of feedwater to the boiler	monitors the boiler high water level	secures the fires when a fusible plug burns out	automatically regulates the quantity of oil and air flow to the burner	
14	454	A	In a diesel engine closed freshwater cooling system employing a radiator, proper water temperature can be obtained by _____.	adjusting the radiator louvers	passing cooling water through a space heater	passing cooling water through the lube oil cooler	piping exhaust gases across the radiator front	
14	455	D	If the combustion control system of an automatically fired auxiliary boiler fails to relight the burner after a normal shutdown, you should check for a/an _____.	low steam pressure	high voltage on the ignition electrode	open air damper	faulty photocell detector	
14	456	B	A waste heat boiler is installed on some diesel propelled vessels to _____.	provide steam for emergency propulsion	provide steam for the turbogenerator	heat the waste water tanks	steam for warming engines	
14	457	B	Why should handhole gaskets not be allowed to leak on an auxiliary boiler?	Water circulation in the boiler will be disrupted.	The gasket and its seating surface may become wire drawn.	The gasket material will become hardened.	Scale and sediment will form on the gasket.	
14	458	D	Automatic combustion control systems for auxiliary boilers are designed to cycle burners on and off in response to the _____.	excess air pressure	steam moisture content	furnace temperature	steam pressure	
14	459	B	The variation in the amount of fuel oil burned in the operation of an auxiliary boiler, utilizing a return flow type atomization system, is a function of the _____.	fuel oil recirculating valve	fuel oil back pressure	fuel supply pressure regulating valve	automatic steam atomizer assembly	
14	460	C	Which of the following conditions could cause black smoke to be discharged from the stack of an auxiliary boiler equipped with turbine-driven rotary cup atomizers?	Insufficient steam supply to the fuel oil heater.	Excessive opening of the dampers in the combustion air inlet.	Improper turbine shaft speed in the atomizer assembly.	Low fuel oil viscosity being maintained.	
14	461	B	Camshafts are usually driven by timing gears or _____.	push rods	chain drives	rocker arms	flywheels	

14	462	D	The main difference between an "APF" and an "APE" type fuel injection pump, is the design of the _____.	plunger	control rack	delivery valve	cylinder arrangement	
14	463	B	The maximum pressure developed by a waste heat boiler is determined by the main engine exhaust _____.	gas composition	gas temperature	pressure	timing	
14	464	C	Which of the listed effects would mixtures of ethylene glycol and phosphate compounds have on the metal surfaces of the cooling system of a diesel engine?	Increases the rate of heat transfer	Retards the flow of cooling water	Protects metallic surfaces from corrosion and the coolant from freezing	Tends to increase corrosion	
14	465	B	Which of the listed parts on a fire-tube auxiliary boiler requires a written report to the Officer-in-Charge of Marine Inspection when renewed?	Cleanout plug gaskets	Fusible plugs	Gage glasses	Water columns	
14	466	C	Automatic combustion control systems for some auxiliary boilers are designed to cycle burners on and off in response to _____.	fuel supply pressure	fuel return pressure	steam pressure	furnace air pressure	
14	467	D	Waterside scale in a fire-tube boiler may cause _____.	increased heat transfer	fireside erosion	high steam demand	overheated tubes	
14	468	B	With regards to a diesel engine crankcase explosion, the most violent is the _____. I. primary explosion II. secondary explosion	I only	II only	both I and II	neither I or II	
14	469	D	When an auxiliary boiler is panting and emitting black smoke, you should _____.	increase the fuel oil temperature	decrease the fuel oil temperature	decrease the fuel oil supply pressure	increase the air supply	
14	470	D	Bottom blow valves are installed on auxiliary water-tube boilers to _____.	completely drain the boiler in an emergency	prevent sludge from forming in the steam drum	remove floating impurities from the boiler water surface	remove settled solids from the water drum	
14	471	D	The reversing mechanism on a direct reversing large low-speed main propulsion diesel engine, operated by means of oil pressure, can serve to _____.	bring the respective cam under the fuel pump roller	rotate or displace the camshaft according to engine design	bring the respective cam under the air distributor pilot valves	all of the above	
14	472	A	What function is served by the spring piece #34 shown in the illustration?	It closes the nozzle valve when the release port is uncovered.	It opens the nozzle valve when the release port is uncovered.	It opens the nozzle valve when the supply port is covered.	It closes the nozzle valve when the supply port is covered.	See illustration number(s): MO-0059
14	473	A	The correct procedure for giving an auxiliary boiler a bottom blow, is to begin _____.	when the boiler has been secured long enough for most solids to settle	when the boiler has been cooled to ambient temperature	only after raising the water level to within 1/2 inch of the high water cutout	only after bypassing the low pressure pressuretrol	
14	474	A	If the chemical analysis of a lube oil sample taken from a diesel engine indicates an increased neutralization number the _____.	acidity has increased	viscosity has decreased	demulsibility has improved	foaming is guaranteed to occur	
14	475	A	The diesel engine water inlet jumper illustrated is represented by the letter or number _____.	"M"	"N"	"W"	"14"	See illustration number(s): MO-0122
14	476	A	Additional explosion relief valves are fitted on separate spaces of the crankcase such as gear or chain cases for camshaft or similar drives when the _____.	gross volume of such spaces exceeds 21 cubic feet	possibility of explosion exists due to the formation of volatile gases	unit is operating in extreme overload conditions	overall volume of the space exceeds 0.6 cubic meters	
14	477	A	A two stroke diesel engine exhaust temperature will be lower than a four stroke diesel engine of the same displacement because the _____. I. scavenging air is cooling the exhaust gases II. exhaust cycle time is longer	I only	II only	both I and II	neither I nor II	
14	478	A	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?	Supercharged, four-stroke/cycle diesel engine	Supercharged, loop scavenged diesel engine	Turbocharged, crossflow scavenged diesel engine	Turbocharged, return flow diesel engine	

14	479	D	During maintenance inspections of a fire tube auxiliary boiler, you should check for _____.	weaking of the tubes at the tube sheet	burning of tube ends	fireside corrosion	all of the above	
14	480	A	The constant capacity, pressure atomizing, fuel oil burners designed to meet a wide variation in the steaming loads of an auxiliary boiler, are _____.	automatically cycled on and off in response to demand	automatically supplied with more fuel on demand	equipped with standard variable capacity atomizers	equipped with fuel nozzles having variable orifices	
14	481	D	The camshaft on a four-stroke/cycle diesel engine provides a means to operate the _____.	fuel injectors	exhaust valves	intake valves	all of the above	
14	482	B	The item labeled #16 in the illustration is a stack of spring washers. Their function is to _____.	prevent bolt failure by allowing limited movement of the injector when excessively high cylinder pressures are developed	maintain the same hold-down force on the injector regardless of varying engine operating temperatures	permit accurate stretch gauge measurement of bolt elongation during installation	absorb the high pressure pulses developed during the fuel injection process	See illustration number(s): MO-0062
14	483	B	An 8000 horsepower diesel engine has a specific fuel consumption of 0.4 lbs. of fuel per horsepower hour. If each pound of fuel contains 18,500 BTU's and 25% of the available heat leaves the engine with the exhaust, how many BTU's per hour are theoretically available for use in a waste heat boiler?	7.4 million BTU's per hour	14.8 million BTU's per hour	22.2 million BTU's per hour	29.6 million BTU's per hour	
14	484	C	Antifreeze solutions containing ethylene glycol, should not be mixed with corrosion protection oils, as the resultant mixture _____.	is dangerously flammable	promotes scale buildup	may cause frothing	has a higher chloride content	
14	485	C	Coast Guard Regulations (46 CFR) permit tubular type water gage glasses on auxiliary boilers, provided the maximum allowable working pressure does not exceed _____.	600 psi	450 psi	250 psi	125 psi	
14	486	C	In an automatically fired auxiliary boiler, restarting from the normal shutdown cycle in response to steam demand, is initiated by a/an _____.	modulating pressuretrol, sensing both steam pressure and temperature	pyrostat measuring decreased steam temperature	pressuretrol measuring only the steam pressure	electrode sensing water level	
14	487	D	Which of the following methods is typically employed in the design of waste heat boilers to obtain maximum heat transfer, while maintaining low overall weight?	Feedwater is preheated in a separately fired economizer.	An external superheater unit is located above the boiler in the gas passages.	An unfired exhaust gas preheater is added to increase the heat transfer rate.	Steel fins are installed on the generating tube surfaces to increase the effective surface area.	
14	488	C	According to Coast Guard Regulations (46 CFR), which of the following pressures is the highest boiler pressure where a tubular type gage glass may be installed?	100 psig	200 psig	250 psig	300 psig	
14	489	A	At the beginning of the prepurge period on an automatic auxiliary boiler equipped with a programmed control system, the unit will not restart if airflow is not sensed and _____.	the damper is not sufficiently opened	the damper is not fully closed	oil pressure is not sensed	water pressure is not sensed	
14	490	B	A properly adjusted safety valve for an auxiliary boiler will _____.	attain maximum lift when it pops below its set pressure	open with a sharp, clear pop at its set pressure	close sharply when the pressure drops to its set pressure	operate most effectively when it has zero blowdown	
14	491	B	In the illustrated engine, the fuel camshaft gear drive housing is letter _____.	B	F	G	Z	See illustration number(s): MO-0003
14	492	D	Fuel injector nozzles are usually of the multi-orifice type with the number and placement of the holes arranged according to the _____.	type of piston rings	pressure of the fuel system	size of the pump plunger spring	design of the combustion chamber	

14	493	C	The proper main diesel engine prestart steps have been taken, the speed setting lever positioned for start up, and the reversing lever is in the neutral position as shown in the illustration. Which of the following statements describes what will occur when the reversing lever is placed in the ahead position?	As the reversing lever is repositioned, the air supply to "27B" is vented, causing the three position cylinder to be aligned to a position to nullify the input signal.	Valve "1C" shifts, directing control air to device "27A", reversing the control valve and increasing the pressure as the final position of the vane motor is established.	Valve "1D" shifts, directing control air to device "27B" and the three position cylinder, with the action of the cylinder determining the position of the reversing control valve.	Device "27B" will not shift until the three position cylinder transfers the pneumatic signal to the reversing control valve to establish the set point reference.	See illustration number(s): MO-0123 MO-0124
14	494	D	Ethylene glycol, when used as a coolant in a closed cooling system for a diesel engine, is more advantageous than untreated raw water because it _____.	provides a constant pH below 7	provides better vapor-phase cooling	has a higher freezing point and a lower boiling point	has a lower freezing point and higher boiling point	
14	495	B	The water inlet manifold, for the diesel engine shown in the illustration, is represented by the letter or number _____.	"M"	"N"	"W"	"13"	See illustration number(s): MO-0122
14	496	D	Additional explosion relief valves are fitted on separate spaces of the crankcase, such as gear or chain cases for camshaft or similar drives, when the _____.	overall volume of such spaces exceeds 21 cubic feet	possibility of explosion exists due to the formation of volatile gases	unit is operating in extreme overload conditions	gross volume of such space exceeds 0.6 cubic meter	
14	497	B	When conducting a hydrostatic test on a water-tube auxiliary boiler, the test water should be heated to a temperature of at least 70°F. This is done to _____.	minimize the coefficient of expansion within the varying types of metals used in boiler construction	help prevent the formation of condensation on the tube exteriors	eliminate oxygen being carried into the system	all of the above	
14	498	A	A photoelectric cell installed in an automatically fired auxiliary boiler burner management system _____.	opens the burner circuit upon sensing a flame failure	detects a flame failure by monitoring radiant heat from glowing refractory	requires mechanical linkage to secure the burner fuel supply	must be bypassed at low firing rates	
14	499	B	The maximum allowable working pressure on a packaged auxiliary boiler is 200 psig. The normal working pressure for one particular packaged boiler is 175 psig. Which of the following safety relief valve settings would be proper for this boiler?	165 psig	195 psig	210 psig	220 psig	
14	500	C	Coast Guard Regulations (46 CFR) require that oil fired automatic steam boilers, and hot water boilers shall be equipped with a prepurge programming control that will assure at least _____.	2 air changes	3 air changes	4 air changes	5 air changes	
14	501	B	The valve cam slope angle determines the _____.	engine torque characteristics	acceleration rate of valve opening and closing	engine fuel efficiency	diameter of intake and exhaust valves	
14	502	A	The rate of fuel injection in a diesel engine cylinder depends primarily on _____.	the size of the holes in the fuel nozzle	timing of the pump	supply pressure to the pump	shape of the combustion chamber	
14	503	C	A smoking burner with a pulsating flame in an auxiliary boiler, is an indication that the _____.	fuel oil supply temperature is normal	burner electrode is incorrectly positioned	fuel/air ratio is incorrect	ignition current is too low	
14	504	C	According to the chart shown in the illustration, which of the following statements is true concerning antifreeze solutions for diesel engine cooling systems?	A 100% ethylene glycol solution gives the greatest protection against freezing.	The boiling temperature of the solution remains constant at the level of greatest protection against freezing to -70°F (-57°C).	With antifreeze protection of -60°F (-51°C), the boiling temperature could be 230°F to 250°F (110°C to 121°C).	A 30% solution of ethylene glycol will protect the cooling system at temperatures of -18°F (-26°C).	See illustration number(s): MO-0018

14	505	C	On an automatically fired auxiliary boiler, the steam pressure limit switch is wired into the burner electric circuit to _____.	sound an alarm when the burner is shut off	energized the flame scanner circuit when high boiler pressure is reached	shut off the burner when the cutoff pressure is reached	prevent burner operation in the event of low boiler water level	
14	506	B	A variable capacity, pressure atomizing, fuel oil burner functions to _____.	maintain a constant fuel temperature	provide a wide range of combustion	provide a constant fuel return pressure	maintain smokeless fuel oil atomization	
14	507	B	The firing range of a variable capacity, return flow-type fuel atomizer is regulated to meet steam demand by varying the _____.	fuel oil damper setting	fuel oil return pressure	burner register opening	atomizer orifice setting	
14	508	D	Excessive vibration from an auxiliary boiler could be caused by _____.	combustion pulses	insufficient air to the burner	loose hold-down bolts	all of the above	
14	509	A	After lighting off a cold, automatically fired, auxiliary boiler, as steam begins to form, you should _____.	close the air cock	give the boiler a bottom blow	test the safety valve	completely open the steam stop	
14	510	B	In a coil-type forced circulation auxiliary water-tube boiler _____.	steam is recirculated through heating coils in the boiler	hot water flashes to steam in the flash chamber	unevaporated feedwater is lost through the atmospheric vent	response to steam demand is slower than in a fire-tube boiler	
14	511	D	The shape of a diesel engine cam determines the _____.	points of opening and closing of the valve	velocity of opening and closing of the valve	amount of the valve lift from its seat	all of the above	
14	512	B	Which of the fuel nozzle types listed is shown in the illustration?	Pintle	Multi-hole	Open	Self-cleaning	See illustration number(s): MO-0059
14	513	C	Which of the following devices is normally provided to prevent oil starvation in a diesel engine lubrication system utilizing the "full flow" principle?	Duplex strainer	Three-way valve	Pressure relief bypass line around the filter	Mechanical straining filter	
14	514	D	Corrosion inhibitors and/or soluble oils are added to diesel engine cooling systems to _____.	maintain low pH in the cooling water	reduce the cooling water temperature	increase cooling water hardness	form a protective film on metal surfaces	
14	515	D	As shown in the illustrations, the ahead direction has been selected by the diesel engine control system, with the three position cylinder moving downward. Which of the following statements describes the next sequence of events?	The position of the reversing control valve directs pressurized oil to the running direction safeguard, a two position hydraulic rotary actuator with a 98, arc movement.	Each counter action of the aforementioned devices modifies the signal to the reversing servomotor and releases various interlocks and pneumatic safeguards.	When the reversing control valve is in its final position, a hydraulic signal shifts valve "27G" and device "8.07" to the proper open positions, releasing the shutdown servomotor.	When the reversing servomotor flaps (vanes) have been properly rotated by hydraulic flow via the reversing control valve, "27C" and "27F" will be hydraulically shifted.	See illustration number(s): MO-0123 A & B MO-0124 A & B
14	516	C	The cooling water system for the diesel engine shown in the illustration flows through the inlet manifold, to the jumpers, through cylinder liner/head assembly, and out the water discharge manifold. Which of the listed lettered sets represents this circuit?	"M", "N", "9", "5", and "W"	"N", "M", "C", "5", and "W"	"N", "M", "9", "3", and "W"	"W", "3", "9", "M", and "N"	See illustration number(s): MO-0122
14	517	B	Cylinders diameters greater than 230 mm require additional safety devices when the scavenging spaces are openly connected to the cylinders. Which of the following devices will be used to protect such spaces?	Tri-knock fittings	Explosion relief valves	Quick release expansion joints	Stacked plate type inlet check valves	
14	518	C	If poor combustion occurs in an auxiliary boiler due to an air damper linkage being out of adjustment, you would adjust the linkage and then _____.	reset the pressure limit controls	test the high and low fire solenoids	check the photocell window for carbon deposits	check the burner ignition electrode gap	
14	519	B	Which of the automatic boiler controls listed should be tested prior to lighting off an auxiliary boiler?	Automatic bottom blow valve	Low water level cutoff switch	Voltage output of the ignition transformer	Insulation resistance readings in the ignition system high tension leads	

14	520	A	Which of the following conditions would cause "panting" in a steaming auxiliary boiler?	Insufficient combustion air	Low water level	Flame failure	Faulty flame scanner	
14	521	B	The valve cam slope angle determines the _____.	opening and closing points of the valve	opening and closing rate of the valve	height of valve opening	amount of time the valve remains open	
14	522	C	Carbon deposits building up, in, and around the injection nozzle tip are least likely to occur when using which of the listed types of fuel injector nozzles?	Hole	Multi-hole	Pintle	Multi-pintle	
14	523	B	The standard diesel engine lubricating oil filtering system shown in the illustration is classed as a _____.	full flow system	bypass system	shunt system	batch system	See illustration number(s): MO-0056
14	524	C	A large low speed main propulsion diesel engine may become overloaded by_____. I. a heavily fouled hull II. strong head winds and heavy seas	I only	II only	both I and II	neither I nor II	
14	525	C	Which of the following statements concerning the operation of a coil-type forced circulation auxiliary water-tube boiler is correct?	Water is continuously circulated through a preheater before it enters the flash chamber.	Steam is generated in the heating coils and is force fed to an accumulator.	Unevaporated boiler water collects in the bottom of the accumulator.	Moisture is removed from generated steam in a radiant superheater.	
14	526	D	If oil is dripping from the burner of a coil-type auxiliary steam generator, the cause may be _____.	the oil valve not seating properly	a loose burner nozzle	carbon on the burner nozzle causing deflection of oil spray	all of the above	
14	527	B	Coast Guard Regulations (46 CFR) require electric hot water supply boilers to be provided with a/an _____.	audible high water level alarm	temperature limiting device	pressure relief valve set at 212° F	automatic reset pressure limiter	
14	528	C	Coast Guard Regulations (46 CFR) require the programming control sequence for auxiliary boiler operation to include _____.	prepurge period for one complete change of air	ignition period to ignite the fuel 4 seconds after fuel delivery	not to automatically increase the air flow after a safety trip	all of the above	
14	529	B	In a forced circulation auxiliary boiler, steam is formed in the _____.	heating coils	steam accumulator (flash chamber)	hotwell	thermostat tube	
14	530	A	Ignition failure in an automatically controlled auxiliary boiler can be caused by _____.	carbon deposits on the electrode	excessive fuel oil temperature	excessive return oil pressure	brickwork failure	
14	531	B	The arrangement and shape of the cams on a diesel engine camshaft directly control which of the listed groups of operating conditions?	Speed, torque, and horsepower production	Firing order, valve timing, and valve lift	Fuel consumption, efficiency, and cylinder pressure	Scavenge pressure, compression ratio, and exhaust pressure	
14	532	C	Fuel injectors used in heavy fuel oil systems are usually provided with cooling to reduce _____.	cold corrosion of the nozzles	fuel viscosity for better atomization	carbon accumulation on the nozzles	fuel detonation in the cylinders	
14	533	C	A spring-loaded relief valve is located on some lube oil filters in full flow systems to _____.	prevent overpressurization of the filter cartridge	prevent overpressurization of the filter casing	bypass the filter should it become clogged	limit the lube oil outlet pressure	
14	534	D	A diesel engine cooling water system with a pH factor of 3.0 indicates a condition of _____.	slight acidity	slight alkalinity	excessive alkalinity	excessive acidity	
14	535	B	The reversing servomotor shown in the illustration is in position and the engine is about to be restarted. Which statement describes the proper valve position alignment?	Valves "1D" and "1C" are closed, with valves "27B", "30B", "27C", "27F" and "27G" having all shifted to their open positions.	Valves "27B", "30B", "27C", "27F", "27G" and device "8.07" have all shifted and opened.	Valves "27A", "27B", "30B", "27C", "27F", "27G" and device "8.07" have all shifted and opened.	Valves "27A", "27C", "30B", "27F" and "27G" have each opened corresponding to the required magnitude of the ahead direction.	See illustration number(s): MO-123-A&B MO-124-A&B
14	536	D	The main lube oil manifold, for the diesel engine shown in the illustration, is represented by the letter or number _____.	"11"	"17"	"N"	"O"	See illustration number(s): MO-0122

14	537	C	What is required for crosshead type engines that have a scavenging space in open connection to the cylinder?	The air flow from the scavenging space must always be protected by plate type check valves and under no circumstance may other devices be used.	A suitable gasket for the interface of both manifolds is necessary to prevent recirculation of scavenging gases, while additionally minimizing exhaust gas leakage.	The scavenging space is to be permanently connected to an approved fire extinguishing system, entirely separate from the fire extinguishing system of the engine room.	The required equipment for a crosshead type engine is totally dependent upon manufacturers ability to placate market demands.	
14	538	C	A sudden flame failure in an operating auxiliary boiler, equipped with an automatic combustion control system and burning light fuel, could be attributed to a _____.	dead or malfunctioning step up transformer	faulty ignition cable connector	loose connection on the photocell	rapid fuel viscosity increase	
14	539	C	The flame safeguard controls of a large automatically fired auxiliary boiler, may consist of a _____.	stack switch	pyrostat	photoelectric cell	thermistor	
14	540	C	Coast Guard Regulations (46 CFR) permit the use of which of the following fuel oil ignition methods on automatic auxiliary boilers?	Incandescent glow plug	Friction igniter	Light oil pilot	Gas pilot light	
14	541	C	Where is the cam follower most likely to leave the surface of the cam?	ramp	flank	nose	convex contour	See illustration number(s): MO-0045
14	542	A	Which of the following statements concerning fire-tube boilers is correct?	Combustion gases flow through the tubes.	Flames impinge on the tubes.	Combustion occurs in the tubes.	Water flows through the tubes.	
14	543	C	Which of the following statements about a coil-type forced circulation auxiliary water-tube boiler is correct?	Steam is generated in the flash chamber.	Steam is recirculated to the heating coils.	Response to steam demand is comparatively rapid.	Unevaporated feedwater drains to the bilge.	
14	544	A	In a diesel engine cooling water system, a pH of 6.0 indicates a/an _____.	slightly acidic condition	slightly alkaline condition	overtreatment of water	neutral condition of water	
14	545	B	Indirect cooling of fuel injector nozzle holders for diesel engines is accomplished primarily by _____.	heat conduction into the injected fuel oil	heat conduction into the water jacket wall	water circulation through passages in the holder	fuel oil circulation through passages in the holder	
14	546	D	What is the function of the "running direction safeguard", shown in the illustration as item "5.01"?	The isochronous operation of the shut down servomotor and the pneumatic fuel pump cut-out device are dependent on the operation of this safeguard.	This device serves to linearly shift the camshaft into its proper operating position and to "safeguard" this position during all engine operation phases.	Hydraulic pressure is developed by the actuation of this device and is used to power other components in the system, returning all oil directly to the engine sump.	The position of the safeguard permits or prevents the actuation of the shut down servomotor, ultimately affecting the output of the governor.	See illustration number(s): MO-0124
14	547	A	Component "U" of the diesel engine shown in the illustration is called the _____.	crankshaft counterweight	frequency tuner	main bearing support assembly	frame stiffener	See illustration number(s): MO-0122
14	548	D	In which of the following areas of a crosshead engine is a permanently connected fire extinguishing system required?	Exhaust manifolds in excess of eight inches in diameter.	Crankcases having a gross volume in excess of 21 cubic feet.	Turbocharger inlet piping in excess of twelve inches in diameter.	Scavenging spaces in open connection to the cylinders.	
14	549	A	Ignition failure in an auxiliary boiler can be caused by _____.	carbon deposits on electrodes	a jammed open oil solenoid	excess fuel pressure at the nozzle	an excessively long purge cycle	
14	550	C	Which of the clutch types listed is shown in the illustration of the reversing reduction gear unit? (See illustration MO-0085)	Hydraulic coupling	Electromagnetic coupling	Air operated friction clutch	Synchromesh coupling	See illustration number(s): MO-0085

14	551	B	When two cams of the same diameter, one with tangential flanks and the other with convex flanks are compared, the cam with tangential flanks will cause_____.	greater valve lift	more abrupt valve action	less valve seat wear	less valve gear wear	
14	552	A	The long drilled passages shown in the illustration of the cutaway view II-II are for _____.	cooling water flow	fuel supply to nozzle tip	fuel return from nozzle tip	fuel recirculation within the nozzle for cooling purposes	See illustration number(s): MO-0062
14	553	D	The axial thrust of the coupling shown in the illustration tends to separate the runner and impeller during operation when the _____.	ring valves are in the open position	fluid is entrained with air	fluid viscosity decreases	coupling is filled with fluid	See illustration number(s): MO-0089
14	554	B	The pH value of water in a diesel engine closed cooling water system should be maintained between _____.	6.0 to 7.5	8.0 to 9.5	10.0 to 11.5	12.0 to 13.5	
14	555	A	If the wearing rings of device "7" shown in the illustration become worn, how will the evaporation rate in "23" be affected?	The rate of evaporation will decrease.	The rate of evaporation is dependent on the level of vacuum maintained within the unit, and not the flow of water to the unit.	Device "7" does not use wearing rings, as these are normally positive displacement pumps.	The rate of evaporation will not be affected as the standby pump, labeled "8" will be used instead.	See illustration number(s): MO-0111
14	556	A	Part "G" of the device shown in the illustration is used _____.	to bleed off accumulated water that would prevent the operating slide from moving down	as the sole means for moving the operating slide into the reseated position	to externally discharge the sludge	solely to hydrodynamically balance the bowl while in operation	See illustration number(s): MO-0012
14	557	D	The purpose of the safety relief valves installed on an auxiliary boiler is to _____.	relieve excess fuel oil pressure during the "off" fire cycle	admit water to the dry pipe	throttle the forced draft fan output for proper combustion	reduce excess steam pressure in the boiler	
14	558	B	An AC diesel generator incapable of being paralleled with the main bus normally employs an isochronous governor in order to _____.	increase speed droop in proportion to load	maintain a frequency of 60 cycles per second	increase or decrease engine speed upon load demand	prevent attempts to parallel	
14	559	B	The most common contaminate of governor hydraulic fluid is _____.	moisture	dirt	acid	air	
14	560	C	The component labeled "F" on the device shown in the illustration, during the normal operation of the centrifuge should be _____.	in the down position as a result of establishing the water flow through "Q"	in the down position as a result of the applied spring force during the self-cleaning cycle	in the up position as a result of the applied spring force after the water flow through "P" is secured	in the up position as the only result of securing the water flow through "Q"	See illustration number(s): MO-0012
14	562	A	Which of the substances listed is satisfactorily removed from the fuel by a centrifugal oil purifier?	Carbon particles	Lube oil	Gasoline	Diesel fuel	
14	563	C	A magnetic strainer is used in the diesel engine reduction gear oil system to remove small particles of _____.	water	babbitt	iron or steel	acids	
14	564	A	A two stroke diesel engine exhaust temperature will be lower than a four stroke diesel engine of the same displacement because the _____. I. mep is lower and the scavenging air is cooling the exhaust gases II. valve overlap in a four stroke diesel engine is greater	I only is correct	II only is correct	both I and II are correct	Neither I or II are correct	

14	565	D	The component labeled "5.26", shown in the illustration, is the "pneumatic fuel pump cutout device". Which of the following statements correctly describes its operation?	If an electrical failure occurs, the solenoid de-energizes permitting spring force to shift the valve to actuate the cutout device by way of the pneumatic signal.	Under normal circumstances, the spring force prevents the admission of air to the cutout device, permitting the operation of the engine under various load conditions.	The forces acting upon the relay eliminate the need for governor produced shutdowns, in addition to supplying the operating medium used in conjunction with this component.	When excessive engine speeds are developed, the operating coil becomes energized, shifting the valve and reducing the operating pressure to cause an engine shutdown.	See illustration number(s): MO-0123 A & B MO-0124 A & B
14	566	D	Two inflatable clutch glands are provided in the main engine reduction gear illustrated because _____.	this is a two-speed gear	additional clutch friction is required at high speeds	one is a spare in the event of failure of the primary gland	the gear must operate both ahead and astern	See illustration number(s): MO-0085
14	567	B	The device labeled "B" in the illustration is a _____.	crankshaft rotating at twice the speed of the camshaft	camshaft rotating at the speed of the crankshaft	crankshaft rotating at the speed of the camshaft	camshaft rotating at twice the speed of the crankshaft	See illustration number(s): MO-0122
14	568	A	Which of the following listed construction details of internal combustion engines is required?	A warning notice to caution against the opening of a hot crankcase for a specified period of time after shut down.	The use of end block construction for engines developing over 1000 brake horsepower.	Removable cylinder liners must be used for engines developing over 1000 brake horsepower.	All engines shall be provided with an exhaust gas pressure monitoring system.	
14	569	D	The safety valve installed on a coil-type auxiliary boiler is located on the _____.	thermostat tube	topmost coil	water tank	flash chamber	
14	570	C	In the schematic diagram of the isochronous hydraulic governor shown in the illustration, piece #22 is the _____.	pilot plunger	proportioner piston	balance piston	differential servo piston	See illustration number(s): MO-0100
14	571	B	Which of the following statements is true concerning pressure limit switches and pressuretrols installed on auxiliary boilers?	They are bimetallic elements sensing temperature differentials corresponding to pressure changes.	They consist of a bellows assembly, linked with a snap action switch, through a pressure adjusting mechanism.	They automatically relieve excessive steam pressure by acting as a pilot to the safety valve.	They automatically restart the burner sequence via the high water level signal.	
14	572	B	A port-and-helix fuel injection pump having upper and lower plunger helixes is designed to _____.	vary fuel delivery and return pressure	vary the beginning and ending of injection	operate with residual fuels only	provide maximum fuel delivery rate	
14	573	D	The lube oil strainer shown in the illustration is used on the reduction gear of a mid-size diesel engine. The strainer elements consist of _____.	pleated paper	wire mesh	fibrous braid	metal disks	See illustration number(s): MO-0057
14	574	C	When checking zincs in a saltwater cooled heat exchanger, you should _____.	paint the zincs to stop corrosion	insulate the zincs to alter the temperature	replace the zincs if they are 50% consumed	file the zincs to change the shape	
14	575	A	The axial thrust of the coupling shown in the illustration, tends to draw the runner and impeller together when the _____.	coupling is partially filled with fluid	clutch is operating continuously	rotor housing is full of fluid	fluid is extremely viscous	See illustration number(s): MO-0089
14	576	B	The part labeled "R" on the device shown in the illustration is used to _____.	prevent part "F" from independently rotating	drain off the closing water at the beginning of the self-cleaning cycle from under the sliding bowl bottom	drain off the closing water at the end of the self-cleaning cycle	drain off the opening water at the end of the self-cleaning cycle	See illustration number(s): MO-0012
14	577	C	In reducing engine speed to an efficient propeller speed by the use of reduction gears, _____.	speed and torque are both reduced	speed is reduced and torque remains unchanged	speed is reduced and torque is increased	speed is sometimes unchanged while torque is increased	

14	578	D	One advantage of hydraulic clutches over mechanical clutches in diesel engine installations is _____.	the power is transmitted at a very high efficiency of 60%	the torsional vibrations are transmitted directly to the reduction gears	each clutch has a separate oil gland for reverse operation	no mechanical connection exists between the driving and driven elements	
14	579	D	A diesel generator governor is hunting. After changing the oil the governor is flushed and the compensation needle valve is adjusted; but the hunting persists. You should NOW _____.	check air intake manifold pressure	calibrate the fuel pump rack settings	set the speed droop adjustment to zero	carefully check for binding in the governor linkage	
14	580	C	The port labeled "H" of the device shown in the illustration, is used to _____.	prevent water from accumulating beneath the operating slide	provide water flow for closing the bowl at the end of the desludging cycle	bleed off the opening water to permit the closing sequence of the bowl at the end of the desludging cycle	directly discharge accumulated sludge from the bowl	See illustration number(s): MO-0012
14	581	A	In order to reverse the rotation of a two-stroke/cycle loop scavenged, direct reversing, propulsion diesel engine, the cam positions must be changed for the _____.	starting air and fuel pumps	piston cooling pumps	exhaust valves	all of the above	
14	582	C	Some fuel injection systems utilize port-and-helix metering. Which of the following statement describes a system "timed for port closing"?	Injection has a variable beginning and a constant ending.	Injection is metered by an external delivery valve.	Injection has a constant beginning and variable ending.	Injection will not occur until the helix closes the delivery valve.	
14	583	A	During a routine round of a diesel engine generator, you observe a low oil level in the governor sump. If there is no visible sign of external leakage, you should suspect the cause to be a/an _____.	leakage through the governor drive shaft oil seal	leakage through the power piston oil seal	uncovered sight glass ventilation orifice	defect in the sight glass gasket	
14	584	B	The liquid line labeled "Q" on the device shown in the illustration is used to _____.	initiate the bowl opening procedure for the self-cleaning cycle	initiate the bowl closing procedure for the self-cleaning cycle	initially prime the bowl	directly position the oil emulsion interface throughout the operation of the centrifuge	See illustration number(s): MO-0012
14	585	A	A continuous fluctuation of the speed, due to overcontrol by the governor, is known as _____.	hunting	sensitivity	promptness	speed droop	
14	586	B	Airflex clutches are used to transmit power from a diesel engine to the propeller shaft. A restricted orifice is used in the control air system of this unit to _____.	delay deflation of the clutch being disengaged	delay inflation of the clutch being engaged	reduce the deflation time of both clutches	reduce the inflation time of both clutches	
14	587	A	The purpose of try-cocks used on an auxiliary boiler is to _____.	provide an alternate means of determining the water level, if the gage glass fails	provide a means of adding chemical feed to the boiler water	provide a means for blowing down the gage glass	act as a steam sentinel valve, if any of the fusible plugs should melt	
14	588	B	The device shown in the illustration can be automatically or manually activated for self-desludging. The desludging process is initiated by which of the labeled components listed below?	"F"	"P"	"Q"	"R"	See illustration number(s): MO-0012
14	589	B	When an additional load is applied to a diesel engine which is using an air bladder clutch unit that is inadequately inflated, you can expect _____.	chipped reduction gear teeth	overheating because of slipping shoes	pneumatic seizure	excessive wear on the thrust bearings	
14	590	D	A diesel engine is equipped with an isochronous hydraulic governor. A decrease in load will cause the engine speed to _____.	decrease only	increase only	decrease slightly then returned to original speed	increase slightly then returned to original speed	
14	591	A	The reversing cams of some four-stroke/cycle diesel engines are brought into position by _____.	sliding the camshaft along its axis	rotating the cam 180°	rotating the cam followers 180°	moving the idler sprockets in the drive chain	
14	592	A	Which of the following statements describes a fuel injection pump marked "timed for port closing"?	Injection has a constant beginning and variable ending.	The pump stroke determines the amount of fuel injected.	Fuel is metered by the pump's delivery valve.	Timing reference marks should be changed.	

14	593	C	The device shown in the illustration can be automatically or manually desludged. The closing sequence at the end of the desludging cycle is initiated by opening which of the labeled components listed below?	F	P	Q	R	See illustration number(s): MO-0012
14	594	C	The thermostatic valve in the illustration is used for controlling the coolant temperature in a main propulsion diesel engine. Which of the following can be used to verify proper valve operation with the valve disassembled?	Remove and examine the contents of the power pellet.	Check spring compression values against data given in manufacturer's handbook.	Place the thermostatic element in a container of water at various operating temperatures and note the movement of the valve stem.	Chemically analyze contents of power pellet.	See illustration number(s): MO-0079
14	595	B	When would it be become necessary to use the device labeled "4.07", shown in the illustrations?	The servomotor control lever provides a prepositioned proportional input to the reversing servomotor during engine control tests.	When the reversing lever fails to produce the required output, the direction of engine rotation is manually controlled by the reversing control valve.	During periods of rapid response, it is necessary to use the manually controlled reversing control valve to shorten the time lapse when answering bridge commands.	Device "4.07" provides a variable fulcrum, permitting proper initial adjustment of the components directly attached.	See illustration number(s): MO-0123 MO-0124
14	596	C	The diesel engine component labeled "Z", shown in the illustration is called the _____.	inlet valve framing assembly	EGT monitor	exhaust valve bridge	scavenging air inlet	See illustration number(s): MO-0122
14	597	B	Internal combustion engines are to be fitted with governors to prevent the engines from exceeding the rated speed by more than _____.	10 percent	15 percent	20 percent	25 percent	
14	598	C	To stop the diesel engine governor from hunting, the governor oil system is to be purged of trapped air by adjusting the part shown in the illustration labeled _____.	A	B	C	D	See illustration number(s): MO-0096
14	599	A	Slippage of an air operated friction clutch can result from _____.	an overloaded engine	prolonged slow speed operation	weak disc springs	newly installed friction blocks	
14	600	B	Misalignment of the drive shaft and propeller shaft flanges can be detected by using a dial indicator or _____.	inside micrometer	feeler gage	adjustable trammel	sighting device	
14	601	D	From the data given in the illustration, which pair of pistons listed are mounted on the same crank throw?	1L/8R	3R/1L	5R/7L	3L/3R	See illustration number(s): MO-0004
14	602	C	A plunger is used in the fuel injection pump shown in the illustration "timed for port closing." The injection process will always have a _____.	constant beginning and constant ending	variable beginning and variable ending	constant beginning and variable ending	variable beginning and constant ending	See illustration number(s): MO-0063
14	603	A	The sludge ejection cycle of the device shown in the illustration is initiated by the centrifuge when valve(s) _____.	"V5" is closed, with "V15" and "V16" open	"V5," "V10," "V15," and "V16" are all closed	"V10," "V15," are closed with "V5" and "V16" open	"V5," "V10," "V15," and "V16" are all open	See illustration number(s): MO-0024
14	604	D	The temperature at which an adjustable bellows type thermostat valve is set by _____.	changing the position of the actuating bulb	replacing the bellows with a heavier spring	varying air loading pressure to the bellows	changing spring compression to oppose the bellows	
14	605	D	The device shown in the illustration as item "4.01", is called the _____.	reversing control valve	running direction safeguard	control system oil pump	reversing servomotor	See illustration number(s): MO-123 A&B MO-124 A&B
14	606	D	The diesel engine component labeled "1", shown in the illustration is called a/an _____.	inlet valve spring	external thread	conical speed/surge prevention device	exhaust valve spring	See illustration number(s): MO-0122

14	607	C	In addition to the normal governor, each main engine having a maximum continuous output of 300 hp and over, which can be declutched or which drives a controllable pitch propeller, _____.	is not required to have any additional overspeed protection provided a hydraulic governor is used	and is a direct reversible engine, is required to have an overspeed trip set to secure the fuel to the engine when its rated speed is exceeded by more than 15 percent	is to be fitted with a separate overspeed device so adjusted that the speed cannot exceed the maximum rated speed by more than 20 percent	will not require any additional overspeed protection provided a mechanical type governor is used	
14	608	B	Where one or more diesel driven AC generators are operating in parallel, reducing the value of the speed droop to "zero" on one unit will allow that unit to _____.	gradually reduce its speed as load is applied	change load without changing speed	automatically divide and balance the loads	effectively anticipate the amount of fuel necessary to bring the engine up to the proper output to accept the increased load	
14	609	B	Torque capacity of the air clutch shown in the illustration, may be increased by _____.	putting in a thinner friction plate #6	increasing air pressure	removing clutch spring #4	adjustment of nut #22	See illustration number(s): MO-0090
14	610	C	Immediately at the end of the sludge ejection cycle, the bowl of the fuel oil centrifuge, shown in the illustration, will be closed only when the valve(s) _____.	"V5" is closed, with "V10," "V15," and "V16" are open	"V5," "V10," "V15," and "V16" are closed	"V10" and "V16" are open, with "V15" and "V5" closed	"V5," "V10," "V15," and "V16" are open	See illustration number(s): MO-0024
14	611	C	What is the crank angle between any two crank throws in the firing order of a four-stroke/cycle, in line, eight cylinder diesel engine?	45°	60°	90°	100°	
14	612	A	Increasing the load on an engine using a double-helix type injection pump varies the effective stroke of the pump to start _____.	earlier and end later	later and end earlier	and end later	and end earlier	
14	613	A	Effective hydraulic coupling operation depends upon a certain amount of _____.	slip	mechanical friction	fluid overheating	torsional vibration	
14	614	D	If the cooling water temperature and the lube oil temperature in a diesel engine are too high, the cause can be _____.	a dirty lube oil strainer	internal water leaks	an oil suction line restriction	excessive wear of the cooling water pump	
14	615	A	The gear drive, shown in the illustration, can have the backlash determined best by using a _____.	feeler gauge	lead wire	red dye indicator	lash indicator	See illustration number(s): MO-0091
14	616	A	Regarding the water level electrode assembly shown in the illustration, the normal water level will ordinarily rise and fall between _____.	"B" and "C"	"C" and "E"	"B" and "E"	"B" and "D"	See illustration number(s): MO-0047
14	617	C	Most large, low-speed, main propulsion diesel engines use duplex lube oil strainer to _____.	decrease the time required between cleanings	remove all large and small foreign objects	ensure a positive flow of oil at all times	ensure that all lube oil has been treated twice	
14	618	A	Which of the springs shown in the illustration, will have its output force controlled by the movement of a speed control shaft, and the engine speed setting will in turn be proportional to the amount of compression exerted on the spring?	19	34	46	50	See illustration number(s): MO-0095
14	619	C	While inspecting the main bearings on a diesel engine you find impregnated dirt and scratches in the bearing surface. You would, therefore, suspect that _____.	the bearing had been overheated	water was present in the oil	the lube oil was not being properly filtered	the maximum allowable bearing pressure had been exceeded	
14	620	C	The gage glass on a coil-type auxiliary boiler is connected to the _____.	heating coil inlet and outlet	surge chamber	accumulator	water softener	
14	621	B	The linear motion of a diesel engine piston is converted to the rotary motion required to drive gears, propeller shafts, and generators by the _____.	flywheel	crankshaft	journal bearings	camshaft	

14	622	B	The port-and-helix metering pumps, used in diesel fuel injection systems, are usually designed to produce a constant beginning and a variable ending of fuel injection. These pumps are usually _____.	timed for port opening	timed for port closing	controlled by rack movement	controlled by plunger stroke	
14	623	D	Where may a strainer be located in a diesel engine lubricating oil system?	Suction line	Discharge line	Supply line	In any combination of the above.	
14	624	D	High diesel engine cooling water temperatures can be caused by _____.	a worn water pump	not enough coolant	air in the cooling system	all of the above	
14	625	C	What is the primary function of the reversing servomotor shown in the illustration as item "4.01"?	Once the servo pump has developed sufficient pressure, the servo motor will provide the initial signal to release the fuel blocking valve.	The servomotor is used to lift the fuel pump cams prior to engine rotation during start up.	The component rotates the pilot starting valve cam in the starting air distributor, as well as the fuel pump cams, in the required direction and operating position.	The oil pressure developed between the vanes of this device is proportional to the mechanical energy required to drive the camshaft and its associated components.	See illustration number(s): MO-123 A&B MO-124 A&B
14	626	D	The inlet valves for the diesel engine shown in the illustration are indicated by the letter or number _____.	"2"	"I"	"H"	none of the above are correct	See illustration number(s): MO-0122
14	627	C	Which of the listed problems would be indicated by an accumulation of water in one cylinder, in addition to the crankcase of an idle diesel engine?	Excessive condensation in that cylinder.	Water in the fuel system.	Cracked cylinder liner.	Leaking lube oil cooler.	
14	628	A	One advantage of electromagnetic slip couplings is _____.	torsional vibrations are reduced	torque increases with a decrease in excitation current	the coupling rapidly responds to sudden changes of load	excitation and induction power losses appear as a change in torque instead of rotational speed between the primary and secondary elements	
14	629	C	If a hydraulic governor has been refilled with oil, the engine should be operated until it reaches normal temperature, then the air should be purged, and the _____.	rack position should be adjusted	compensating needle valve should be opened fully	compensating needle valve should be adjusted to stabilize operation	speed limiting device should be adjusted	
14	630	A	Which of the labeled figures illustrated, represents the correct alignment mark relationships of a properly reassemble centrifuge bowl?	A	B	C	D	See illustration number(s): MO-0022
14	631	D	The rotary motion of a diesel engine crankshaft is obtained from the up and down motion of the piston via the _____.	camshaft	reduction gears	rocker arm	connecting or piston rod	
14	632	A	What are the effective stroke characteristics for the injection pump plunger shown in the illustration?	Constant beginning and variable ending	Constant beginning and constant ending	Variable beginning and constant ending	Variable beginning and variable ending	See illustration number(s): MO-0061
14	633	D	Unusually low oil pressure in the lube oil header of a diesel engine is the result of a/an _____.	pressure regulating valve being stuck in the closed position	restricted lube oil passage in the engine	air leak in the lube oil cooler	air leak in the oil pump suction line	
14	634	A	High diesel engine cooling water temperatures can be caused by _____.	air in the cooling system	an overhauled water pump	correct amount of coolant	no air in the cooling system	
14	635	B	A diesel engine is operating at 1800 RPM and driving a propeller at 600 RPM. What is the speed reduction ratio?	0.30 to 1	3.00 to 1	3.33 to 1	33.0 to 1	
14	636	B	The power loss associated with slip in a fluid coupling appears as _____.	chattering in the driving member	heat in the hydraulic fluid	vibration in the driving member	leakage around the ring valve	

14	637	C	In order for the self-cleaning fuel oil centrifuge, shown in the illustration, to properly operate during the desludge cycles, the _____.	bowl locking ring alignment mark should be approximately 1/4 inch to the left of the bowl alignment mark	sliding bowl bottom and operating slide seal rings should be coated with main engine lube oil	sliding bowl bottom and operating slide seal rings should be coated with a high temperature lubricating paste	all of the above	See illustration number(s): MO-0012
14	638	C	The purpose of the compensating adjustment used in a diesel engine hydraulic governor is to _____.	compensate for low oil level	increase governor promptness	prevent governor hunting	limit engine load	
14	639	B	Part "I" of the device shown in the illustration is known as the _____.	top or separating disks	intermediate disks	bottom disk	paring disk	See illustration number(s): MO-0012
14	640	A	When the steam pressure drops below a set value on an automatically fired auxiliary boiler, fitted with rotary cup atomizers, the combustion control system will _____.	increase the fuel oil control valve opening	increase the rotary cup speed	decrease the back pressure regulating valve opening	decrease the supply steam control valve opening	
14	641	C	The main reason counterweights are added to crankshafts is to _____.	reduce piston side thrust	reduce crankshaft end thrust	provide uniform loading and wear of main bearings	increase the strength of the crank webs	
14	642	A	An individual injection pump is designed for variable beginning and constant ending of injection. For diesel engines operating at constant speeds, the start of injection will _____.	advance as the load increases	retard as the load increases	remain unchanged regardless of load	always occur at top dead center	
14	643	C	Diesel engines driving alternators operating in parallel must maintain a set frequency regardless of load changes. The governor characteristic used to accomplish this is known as _____.	actuation	sensitivity	compensation	promptness	
14	644	C	The control system for a controllable pitch propeller can be programmed _____. I. to produce a maximum combined propeller and engine efficiency between pitch and a given engine speed II. for continuous operation of the engine at pre-set conditions	I only is correct	II only is correct	both I and II are correct	neither I or II are correct	
14	645	B	What medium is used to rotate and then maintain the position of the flaps (vanes) of the device shown in the illustration as item "4.01"?	Compressed air is used to shift the device to the proper position, then applying hydraulic pressure to maintain this position during maneuvering.	Engine lubricating oil is used to rotate the flaps (vanes), but the rotation of the drive gear is used to maintain contact between the flaps and the stop segments.	A jacking disc is provided specifically to turn the camshaft during normal operation, as the action of the mechanical stops is concurrent with the rotation of the engine.	The device is actuated and maintained in its new position by the application of pneumatic pressure, while during maintenance procedures the jacking disc may be used.	See illustration number(s): MO-0124-A
14	646	B	The diesel engine component labeled "3", shown in the illustration is called the _____.	head valve assembly	cylinder head	scavenging air space	cylinder liner	See illustration number(s): MO-0122
14	647	A	At what pressure should a cylinder relief valve of an internal combustion engine be set to relieve?	The device should be set to relieve at a pressure not more than 40 percent in excess of the maximum firing pressure.	The valves should be set to just stop relieving with the engine running at full speed.	Cylinder relief valves should only be adjusted by an authorized repair facility with the permission of the OCMI.	Cylinder relief valves are no longer required for large low speed engines due to advancements in combustion engineering.	
14	648	D	When changing the direction of propeller shaft rotation in a diesel plant equipped with a pneumatic clutch, you must pause at neutral to allow the _____.	fuel rack to readjust	engine to slow down	propeller to stop	clutch to deflate	

14	649	D	When reassembling the bowl of the centrifuge, shown in the illustration, the alignment mark on the locking ring passes the bowl cover mark in excess of the manufacturer's specifications. This is due to _____.	too many disks being left out of the bowl during reassembly	the paring devices have been reinstalled in the wrong order	the disks have not been placed back in the bowl in numerical sequence	excessive wear of the locking ring and/or bowl threads	See illustration number(s): MO-0012
14	650	A	A schematic diagram of an isochronous hydraulic governor is shown in the illustration. When the load is removed the speed increases, and the _____.	pilot valve (piece #10) moves upward	proportioner piston (piece #25) moves upward	flyweights (piece #8 and #9) move inward and the pilot valve (piece #10) moves downward	balance piston (piece #22) moves downward	See illustration number(s): MO-0100
14	651	C	A viscous damper, as used on a marine diesel, is a sealed precision built device which dampens the torsional vibrations in the _____.	camshaft	flywheel	crankshaft	thrust shaft	
14	652	A	The end of fuel injection in a port-and-helix metering pump can be controlled by _____.	uncovering a fuel port in the pump barrel	covering a fuel port in the pump barrel	closing the fuel pump delivery valve	opening the fuel pump delivery valve	
14	653	B	Loss of lubricating oil pressure to the main propulsion diesel engine will actuate a/an _____.	overspeed trip	audible/visual alarm	the ships/boats general alarm	reserve oil storage tank	
14	654	D	Higher than normal jacket water temperatures occurring in all cylinders of a diesel engine can result from a/an _____.	oil suction line restriction	correct amount of coolant	cavitation erosion in the water jackets	clogged sea suction strainer	
14	655	D	If the operating speed of a diesel engine increases without an apparent change in the engine control settings, you may suspect a _____.	clogged intake air intercooler	control air leak	leaking air starting valve	malfunctioning governor	
14	656	A	Regarding the water level electrode assembly shown in the illustration, arrow "C" indicates the point at which the _____.	feed pump starts	feed pump stops	fuel oil solenoid is de-energized	normal water level is established	See illustration number(s): MO-0047
14	657	D	Trapped air was bled from the hydraulic system of a diesel engine governor while it had been operating at idle speed. Oil was added to restore the correct level and the air vent plug tightened. The compensating needle valve should then be gradually _____.	opened until hunting is eliminated	closed until it is approximately 1/16 of a turn open	closed to cause the engine to hunt in order to purge trapped air from the new oil	closed until engine hunting is eliminated	
14	658	C	In the device shown in the illustration, the component lettered "A" is the _____. (See illustration MO-0012)	heavy phase discharge port	light phase discharge port	dirty oil input port	seal water input port	See illustration number(s): MO-0012
14	659	D	Automatically fired auxiliary boilers use fuel oil strainer arrangements of either the simplex type or _____.	filter bag type	metal disc type	absorbent type	duplex type	
14	660	C	When centrifuging heavy fuel oil, an important factor to consider is the _____. I. flow rate II. viscosity of the fuel oil	I only is correct	II only is correct	both I and II are correct	neither I or II are correct	
14	661	B	A crankshaft whose center of gravity coincides with its center line is said to be _____.	dynamically balanced	statically balanced	counter balanced	resonantly balanced	
14	662	C	The amount of fuel injected in a particular time, or degree, of crankshaft rotation is termed _____.	metering	timing	rate of injection	rate of distribution	
14	663	D	In a normally operating diesel engine, the main source of lubricating oil contamination in the crankcase is a result of the _____.	metal particles loosened by wear	air when no air cleaners are used	condensation of water vapors	breakdown of the lubricating oil by dilution	
14	664	C	Which of the following problems will cause above normal cooling water temperatures in a diesel engine using a closed freshwater cooling system?	An air leak in the header tank cover	Benzotriazole found in the primary water	Eroded baffle in the cooler	Low level in expansion tank	

14	665	A	The reversing servomotor is shown in the illustration as device "4.01". Which of the following statements describes the subsequent actions to occur after the flaps (vanes) have made contact with the respective stop segments?	The end position indicator should indicate green and the respective control lamp should be illuminated.	Frictional wear occurs each time the flaps (vanes) make contact with the stops and is compensated by the ease in which the stops may be replaced during the biannual inspection.	Upon completion of the shift, a pneumatic signal is diverted to the air start system, simultaneously deactivating the governor release mechanism.	Once the movement is completed, a pneumatic signal is diverted to the fuel pump cutout device to permit engine operation.	See illustration number(s): MO-0123 MO-124
14	666	C	Which of the following statements represents an advantage of an electromagnetic clutch?	Large misalignments can be tolerated between the shaft and engine coupling.	Slip is held to a minimum when reversing shaft rotation.	Engine torsional vibrations to the driven shaft are eliminated.	It aids in maintaining power factor.	
14	667	C	The diesel engine piston illustrated is indicated by the component labled _____.	K	3	4	6	See illustration number(s): MO-0122
14	668	A	Two air compressors are provided for the starting air system and should be capable of _____.	charging the starting air containers within one hour	providing the minimum quantity of starting air at all times	supplying all the air necessary to start both the main engine and an auxiliary at the same time	topping off all receivers at the required design pressures	
14	669	B	Which of the following adjustments is always required whenever the diesel engine governor oil has been drained and renewed?	Speed droop	Compensation	Idle speed setting	Load limit control	
14	670	A	The air supplied to a diesel engine is compressed to _____. I. provide heat for the ignition of the fuel II. decrease injection delay	I only is correct	II only is correct	both I and II are correct	neither I or II are correct	
14	671	C	The possibility of damage from operating a diesel engine at critical speeds is reduced by the use of _____.	an isochronous governor	elastic engine mounts	a vibration damper	a cast iron bed plate with good flexible qualities	
14	672	D	The position of the fuel injection pump plunger, shown in the illustration, will provide fuel delivery to the diesel engine in an amount approximately equal to _____.	zero fuel flow	normal fuel flow	light fuel flow	maximum fuel flow	See illustration number(s): MO-0061
14	673	A	On small diesel engines, a noticeable decrease in the time interval between the replacement of the lube filter cartridge indicates _____.	piston ring blow-by	dirty air filter	excessive oil pressure	excessive oil temperature	
14	674	C	If the jacket water temperature of an operating diesel engine suddenly rises above normal, the cause can be attributed to _____.	an overfilled expansion tank	excess chromate treatment of the jacket water	a clogged raw water sea suction	cavitation erosion of the heat exchanger tubes	
14	675	C	On a diesel engine equipped with a hydraulic speed control governor, hunting in many cases can be corrected by adjusting the _____.	accumulator spring compression	balance piston	compensating needle valve	proportional piston	
14	676	A	The liquid line labeled "P" in the device shown in the illustration, is used to _____.	initiate the bowl opening procedure for the self-cleaning cycle	initiate the bowl closing procedure after the self-cleaning cycle	initially prime the bowl	directly position the oil emulsion interface throughout the operation of the centrifuge	See illustration number(s): MO-0012
14	677	C	In an auxiliary boiler steam and water system, the highest pressure will be in the _____.	steam stop valve	dry pipe	feedwater system	generating tubes	
14	678	D	How is the diesel engine operating RPM affected when a "ZERO DROOP" setting is selected on the governor?	The RPM will drop to low idle when load is applied.	The RPM must be manually controlled by the load limit knob.	The governor has no control over RPM in this mode.	The RPM will remain the same with or without load.	
14	679	A	The clutch glands of the gear unit, shown in the illustration, rotate at _____.	engine speed	propeller shaft speed	an intermediate speed	a fixed speed	See illustration number(s): MO-0085

14	680	B	When preparing to clean the fuel oil centrifuge shown in the illustration, the bowl must be brought to a complete stop to avoid _____.	contamination of the clean fuel oil	irreparable damage to the unit	contamination of the unit's lube oil supply	premature loss of the bowl seal liquid	See illustration number(s): MO-0012
14	681	B	The diesel engine connecting rod shown in the illustration is classified as a/an _____.	marine-type rod	fork-and-blade type rod	articulated type rod	primary type rod	See illustration number(s): MO-0010
14	682	C	The amount of fuel delivered by a helical plunger fuel injection pump is controlled by _____.	varying the pump discharge pressure	varying the pump return pressure	rotation of the pump plunger	rotation of the pump barrel	
14	683	B	A dirty diesel engine oil filter element can best be detected by _____.	visual inspection of the elements	the pressure drop across the filter	high lube oil sump temperature	decrease in oil viscosity from the filter	
14	684	B	If the coolant temperature of a closed cooling water system for a diesel engine gradually increases, the trouble usually is _____.	a broken shaft on the freshwater pump	an excessive accumulation of scale in the heat exchanger	an incorrect thermostatic element operating range	lube oil in the cooling water	
14	685	C	Which of the following statements concerning the lubrication of diesel propulsion engines used in vessels over 300 gross tons is most accurate?	Lubrication systems using engine driven lube oil pumps do not require any additional independent arrangements when such arrangements have been proven reliable.	The use of engine driven pre-lube pumps is permitted on vessels with propulsion systems developing less than 500 shaft horsepower.	When forced lubrication is used for propulsion engines, one independently driven stand-by pump is to be provided in addition to the necessary pumps for normal operation.	Lubrication systems where two oil coolers are fitted require a minimum of two temperature control devices which may be actuated by similar sensors.	
14	686	B	In an electromagnetic coupling, torque to the driven shaft is limited by the _____.	overload trip	coupling pullout value	staybolt strength	shear-off coupling	
14	687	A	If an auxiliary diesel engine will not crank but can be barred over, the trouble may be _____.	starting batteries	water in the cylinder	the driven component is seized	sea suction valve is closed	
14	688	B	Increasing the load on an engine equipped with a constant speed mechanical governor, will cause the engine speed to initially _____.	increase	decrease	fluctuate	remain constant	
14	689	A	One operating characteristic of the reversing reduction gear unit, shown in the illustration, is that once a clutch is engaged, the _____.	engine torque is normally transmitted to the propeller shaft without slip	slip is produced by backlash in the thrust bearings	second clutch may be engaged for additional torque	idle clutch is fully expanded to hold its gear train stationary	See illustration number(s): MO-0085
14	690	A	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 _____.	gravity disk inside diameter is too large	gravity disk inside diameter is too small	back pressure is too low	incorrect number of disks have been place in the disk stack	See illustration number(s): MO-0012
14	691	C	The small end of the connecting rod is attached to the piston with a _____.	crankpin	sliding wedge	wrist pin	torque bushing	
14	692	B	When the lower edge of the spiral begins to uncover the release port in a jerk pump, the _____.	pumping continues until the plunger travels its full stroke	effective pumping stroke of the plunger ends	pressure drops slowly until the full stroke is attained	plunger rotates to the zero delivery position until the next stroke	
14	693	A	The pressure differential across a diesel engine lube oil system duplex filter should be checked to _____.	determine the need for filter cleaning	measure any change in oil viscosity	prevent damage to the filter	determine the need for batch filtration	
14	694	C	Some diesel engines are fitted with a thermometer in the cooling water outlet from each cylinder. If the cooling water temperature from all cylinders begins to rise above normal, you should suspect _____.	increased blow-by in all cylinders	incomplete combustion in all cylinders	overloading in all cylinders	insufficient fuel delivery to all cylinders	
14	695	D	Proper operation of the main engine reduction gear set requires the operator to monitor _____.	the sump oil level	oil flow sight glasses	bearing temperatures	all of the above	
14	696	B	The device shown in the illustration and indicated as the part labeled "B" is the _____.	heavy phase discharge port	light phase discharge port	dirty oil inlet port	sealing water inlet port	See illustration number(s): MO-0012

14	697	C	The fuel oil strainers in the fuel oil service system of an automatically fired auxiliary boiler are permitted by the Coast Guard Regulations (46 CFR) to be either the simplex type or the _____.	Sintered metal type	filter bag type	duplex type	absorbent type	
14	698	C	The torque transmitted by an electromagnetic slip coupling is dependent upon excitation and the _____.	engine speed	harmonic frequency	amount of slip	resonance	
14	699	C	The bowl of a disk type centrifuge is dynamically balanced. To maintain the balance of the bowl after it has been disassembled and cleaned, which of the following statements represent the normal practice of re-assembling?	The disk stack can be reassembled in any sequence.	The disks in the stack must be restacked from the highest numbered disk at the bottom, to the lowest numbered disk at the top.	The disks in the disk stack must be restacked from the lowest numbered disk at the bottom to the highest numbered disk at the top.	If the reassembly of the disk stack does not allow the proper seating of the bowl top, disks from the mid-portion of the stack must be removed.	See illustration number(s): MO-0012
14	700	D	On a diesel engine equipped with an isochronous governor, if the "speed droop" control is reduced to the "zero" setting, the engine _____.	speed will drop drastically with any increase in load	will stop due to zero fuel supply	will stall upon application of load	speed will remain fairly constant despite load changes	
14	701	B	The lower end of the piston rod, shown in the illustration, is fitted into the _____.	piston pin	crosshead	crank pin	crosshead guide	See illustration number(s): MO-0003
14	702	D	The duration of fuel injection developed by an individual port-and-helix fuel injection pump, is determined by the _____.	total pump stroke	pump plunger diameter	plunger helix angle	effective pump stroke	
14	703	A	What could cause the bypass valve in a full-flow lubrication system to open?	Clogged filter element	Bypass valve setting is too high	Check valve stuck open	Fuel dilution of the lubricant	
14	704	A	You are operating a main propulsion diesel engine at a constant load when the jacket water temperature begins to rise. This could be caused by _____.	a piston about to seize	dirty fuel oil filters	fuel oil being too heavy (viscous)	high water level in the expansion tank	
14	705	D	Where the size and design of an engine is such that lubrication before starting is not necessary and an attached pump is normally used, _____.	an additional pump is not required provided the engine driven pump is capable of producing sufficient pressure regardless of the direction of rotation	no additional pumps are required if the vessel is equipped with two propulsion engines clutched to reduction gears through a suitable arrangement	an independently driven pump capable of suppling each engine with sufficient quantities of oil during ahead operations is required	an independently driven stand-by pump is not required if a complete duplicate of the attached pump is carried as a spare	
14	706	A	As shown in the illustration, which of the following conditions would be responsible for a "low pressure in oil outlet" alarm to be indicated?	Throughput too low	Separating temperature too low	Controller setpoint changed	Emergency stop button not reset	See illustration number(s): MO-0127
14	707	B	When air is delivered under pressure to one of the glands of an air-bladder clutch, the _____.	inside diameter of the clutch gland increases	inside diameter of the clutch gland decreases	gland rotates out of contact with the drums	clutch begins to rotate with the engine	
14	708	B	The temperature of the contaminated fuel oil fed to the centrifuge shown in the illustration should be _____.	greater than 212°F	203°F to less than 212°F	160°F to 180°F	selected according to the oil's viscosity index	See illustration number(s): MO-0012
14	709	D	The schematic diagram of an isochronous hydraulic governor is shown in the illustration. If there is an increase in applied load, the speed will decrease, and the _____.	flyweights (piece #8 and #9) move outward and the pilot valve (piece #10) moves upward	balance piston (piece #22) moves upward	proportioner piston (piece #25) moves downward	pilot valve (piece #10) moves downward	See illustration number(s): MO-0100
14	710	D	Wear occurring at the tips of the reduction gear teeth is usually the result of _____.	surface fatigue	fretting corrosion	heavy overloading	gear misalignment	
14	711	C	The diesel engine connecting rod shown in the illustration is called a/an _____.	marine-type rod	articulated rod	fork-and-blade rod	master rod	See illustration number(s): MO-0010

14	712	B	The amount of fuel injected into a cylinder by a unit injector is controlled by _____.	the firing pressure in the cylinder	a metering helix	varying the length of the plunger stroke	varying the clearance between the injector cam and the injector rocker arm	
14	713	C	Before starting a diesel engine that has an engine driven lube oil pump, the engineer should _____.	open the bypass line	cut in the lube oil cooler	pressurize the lube oil system	top off the expansion tank	
14	714	B	The port labeled "G" on the device shown in the illustration is used to _____.	bleed off the opening water from the operating slide	bleed off the closing water from the operating slide	directly discharge accumulated sludge from the bowl	directly maintain the position of the oil emulsion interface	See illustration number(s): MO-0012
14	715	B	The principal purpose of refractory and insulation installed in the firebox of an auxiliary boiler is to _____.	prevent slag accumulation on the corbels	protect the inner casing and reduce heat loss	direct the force draft into the space between the inner and outer casings, to maintain a pressure seal	prevent flame impingement on the generating tube bank	
14	716	B	If an engine operates at 900 RPM at no load, and at 870 RPM at full load, the speed droop is _____.	3.10%	3.40%	3.70%	4.00%	
14	718	A	During the normal operation of the fuel oil centrifuge shown in the illustration, the flow from the port labeled "B" should be _____.	clean oil discharging to the day tank	a consistent, heavy flow of separated water to the bilges	an intermittent flow of water to the sludge tank	thick sludge separated from the clean oil	See illustration number(s): MO-0012
14	719	D	When two medium speed diesel engines coupled in parallel to a common propeller shaft that operates at the same speed as the engines, which of the operating conditions listed will apply?	Full horsepower is available ahead and astern.	One engine must be running ahead and the other astern.	Full reversing torque is not available.	Mechanical reduction gearing is required.	
14	720	A	Air bubbles in a hydraulic governor can cause _____.	sluggish response	speed droop variations	isochronous governing	sensitivity increase	
14	721	A	The temperature of the contaminated fuel oil fed to the centrifuge, shown in the illustration, should be 95,C (203,F) to no greater than 100,C (212,F) in order to _____.	avoid vaporizing the water entrained in the fuel oil	prevent the fuel oil from attaining its flash point	prevent the melting of the tin plate on the bowl interior	avoid warping of the disks in the bowl	See illustration number(s): MO-0012
14	722	B	The amount of fuel delivered for each cycle must be in accordance with the engine load, and the same quantity of fuel must be delivered to each cylinder for each power stroke at that load. Which of the following statements describes this requirement?	Proper timing	Accurate metering	Suitable injection rate	Suitable atomization rate	
14	723	B	In a diesel engine lube oil system, which of the following parts should be lubricated first?	Camshaft bearings	Main bearings	Piston crowns	Cylinder walls	
14	724	A	Fuel oil transfer systems used onboard diesel propelled vessels are required to have _____.	two fuel oil transfer pumps provided where one is to be independent of the main engine	two fuel oil transfer pumps, with a combined capacity exceeding the maximum comsumption of the main engine	engine driven transfer pumps and only used in constant speed applications	the capacity of the engine driven pump exceed the consumption rate of the engine to which it is attached	
14	725	D	Fins are installed on the fireside of the water-tubes, used in waste heat boilers, to _____.	decrease the velocity of gases flowing past the tubes	reduce the accumulation of soot deposits on the tubes	create turbulence	increase the heat transfer surface area	
14	726	D	As shown in the illustration, which of the following conditions would cause the "low pressure in oil outlet" alarm to be illuminated?	Throughput too low.	Separating temperature too high.	Line to pressure switch PS2 obstructed.	All of the above are correct.	See illustration number(s): MO-0127
14	727	A	The port labeled "H" in the device shown in the illustration is used to _____.	bleed off the opening water from the operating slide	bleed off the closing water from the operating slide	directly remove accumulated sludge from the bowl	directly maintain the position of the oil emulsion interface	See illustration number(s): MO-0012

14	728	C	If a main propulsion diesel engine hunts excessively at idle speed, you should _____.	adjust the idle speed control	drain and flush the governor and replace the oil	adjust the compensating needle valve	adjust the load limit	
14	729	C	Although slip in pneumatic clutches is normally undesirable in modern pneumatic clutch arrangements, some reduction gear units are provided with an optional slip clutch which is used to an advantage in _____.	reducing high speed torque vibrations	controlling the warm up of clutch friction surfaces	obtaining maneuvering speeds below engine idle speed	limiting shock loads transmitted to the engine in heavy weather	
14	730	D	A modern centrifuge, similar to the device shown in the illustration, is opened for periodic cleaning. The most common cause of operating failure after reassembling, is due to _____.	low drive motor RPM	excessive back pressure in the bowl and fuel oil break over	the failure of the opening and closing water supply	not replacing the bowl O-rings that have taken a permanent set	See illustration number(s): MO-0012
14	731	C	At dead center, the centerline of the connecting rod usually coincides with the _____.	angularity of the piston motion	inertia moment from the piston	centerline of the cylinder	centerline of the king pin	
14	732	A	The fuel injection pump shown in the illustration, the position of the plunger would give maximum _____.	effective stroke	effective pressure	injection duration	fuel bypass	See illustration number(s): MO-0063
14	733	C	The most crucial time for any bearing with regards to lubrication is _____.	during low loads	after proper oil viscosity is reached	during starting	after cleaning filters	
14	734	B	Immediately after starting a diesel engine, normal raw water and jacket water pressures are indicated. However, the jacket water temperature continues to rise. If there is no change in the sea temperature, you should suspect _____.	overloading in all cylinders	a jammed three-way thermostatic valve	chromate pH too low	a high level in the surge tank	
14	735	C	In a simple hydraulic governor with speed droop, oil under pressure is maintained ready for use in the _____.	power piston	governor sump	spring-loaded piston accumulator	pressure pilot valve assembly	
14	736	D	The hunting of a diesel engine may be caused by _____.	excessive speed droop	insufficient speed droop	excessive sensitivity	low governor power	
14	737	D	Auxiliary boilers can be classified as _____.	water-tube natural circulation boilers	fire-tube boilers	water-tube forced circulation boilers	all of the above	
14	738	C	In the illustration, If gear A has 72 teeth, gear B has 64 teeth, gear C has 24 teeth and gear D has 36 teeth, what is the RPM of the gear D if gear A is turning at 100 RPM?	275.88 RPM	400.63 RPM	533.33 RPM	673.51 RPM	See illustration number(s): MO-0088
14	739	A	The greatest difference between the centrifuge bowl shown in the illustration and that of a tubular bowl, with straight, vertical, interior surfaces, is that the illustrated unit _____.	is self desludging	rotates at 1000 rpm higher than the old tubular bowl type	rotates at 1000 rpm slower than the old tubular bowl type	does not require a discharge ring when operated as a separator	See illustration number(s): MO-0012
14	740	B	Fins are installed on the fireside of the water-tubes used in waste heat boilers to _____.	decrease the velocity of gases flowing past the tubes	increase the rate of heat transfer	reduce accumulations of carbon deposits	direct the flow of gases	
14	741	D	Connecting rods in a diesel engine are used to connect the _____.	engine to the bed	rocker arm to the camshaft	crankshaft to the gear train	piston to the crankshaft	
14	742	A	The term "proper metering", as applied to a diesel fuel injection system, can be best defined as _____.	delivering the same quantity of fuel to each cylinder for each power stroke according to engine load	maintaining the metering adjustment for a reasonable period under all load conditions	timing fuel injection to obtain maximum power and good fuel economy	distributing the fuel to all parts of the combustion chamber for proper combustion	
14	743	B	The magnetic lock between the armature and field in an electromagnetic coupling is established by _____.	controlled engine speed	energizing the field coils	brush contact with the armature	rotating the primary rotor	

14	744	A	The main propulsion diesel engine jacket water temperature rises above normal, with the raw water sea suction and the expansion tank water level being normal. Which of the following problems is most likely the cause?	Faulty thermostatic bypass valve.	Eroded zinc pencils in the heat exchanger.	Steam formation in the expansion tank.	Excessive leakage from jacket water pump seals.	
14	745	B	When fuel oil heaters are required for main engine operation, _____.	each heater shall have the capacity to supply the main engine at full power	at least two heaters of approximately equal size are to be installed	the system shall be designed to permit series or parallel operation	none of the above	
14	746	C	The component labeled "E" on the device shown in the illustration is the _____.	separating disk	operating slide	bowl bottom	gravity disk	See illustration number(s): MO-0012
14	747	B	As shown in the illustration, which of the following conditions would be responsible for a "low pressure in oil outlet" alarm indication?	Steam supply pressure low.	Separating temperature too high.	Throughput too high.	Regulating valve V4 is closed.	See illustration number(s): MO-0127
14	748	B	The rate of heat transfer in a water-tube auxiliary boiler can be increased by _____.	operating the boiler at less than normal water level	installing fins on the firesides of water-tubes	increasing the amount of excess air to the burners	treating the boiler water with chemical oxygen scavengers	
14	749	D	Which of the couplings listed will prevent shock loads from being transmitted to an engine?	Grid	Dog type	Friction	Hydraulic	
14	750	D	Governor hunting is caused by _____.	governor undercontrol	excessive speed droop	insufficient speed droop	governor overcontrol	
14	751	C	In a diesel engine, pistons are attached to the crankshaft by _____.	push rods	lash adjusters	connecting rods	piston guides	
14	752	D	Regarding jerk-type fuel pumps as used on some auxiliary diesel engines, the delivery cutoff point is controlled with a _____.	delivery valve spring	spill port for leakoff	check valve in the guide	helical groove on the plunger	
14	753	A	A diesel engine using lube oil with too high a viscosity will exhibit _____.	increased starting difficulty in cold weather	increased oil consumption	thickening at higher operating temperatures	minimal friction losses	
14	754	B	Some diesel engines are fitted with a thermometer in the cooling water outlet from each cylinder. If the cooling water temperature from an individual cylinder begins to rise, you should suspect _____.	overloading of adjacent cylinders	overloading of that cylinder	increased blow-by in that cylinder	incomplete combustion in that cylinder	
14	755	D	During the operation of the fuel oil centrifuge shown in the illustration, liquid is passing continuously through the sludge outlet, or the bowl is unintentionally "shooting". The probable cause is the _____.	gravity disk inside diameter is too large	gravity disk seal ring is defective	operating slide seal ring is defective	sliding bowl bottom seal ring is defective	See illustration number(s): MO-0012
14	756	B	In the illustrated auxiliary diesel engine governor, decreasing the distance between piece #6 and piece #10 will affect the engine by _____.	decreasing the speed	increasing the speed	increasing the speed droop setting	decreasing the overspeed trip setting	See illustration number(s): MO-0094
14	758	A	Large steam drums are not required in the design of a coil-type auxiliary water-tube boiler because _____.	steam and water are separated in the accumulator (flash chamber)	the heat of combustion is sufficient to remove all moisture from the steam	the volume of steam is small at low pressures	automatic burner cycling controls steam volume and quality	
14	759	B	If the compensating needle valve of a hydraulic governor is opened more than necessary the governor will _____.	have a larger than normal dead band	produce excessive speed response to a load change	respond slowly to any change in engine load	stabilize engine speed at the new governor setting	
14	760	B	The port labeled "D" in the device shown in the illustration is used for discharging _____.	the light phase	accumulated sludge	the dosing water	the closing water	See illustration number(s): MO-0012
14	761	A	Which construction detail is apparent in the connecting rod and piston assembly shown in the illustration?	The piston is designed with a heat dam.	It is a fork assembly.	The piston is water cooled.	The wrist pin is free floating.	See illustration number(s): MO-0011
14	762	A	The plunger in a jerk pump is rotated until the release port is uncovered. If the port remains uncovered all of the time, which of the listed operations will occur?	No fuel will be delivered.	The maximum effective stroke will be attained.	The fuel delivered to the cylinder will be excessive.	The injection nozzle will overheat and carbonize.	

14	763	B	Immediately after any diesel engine is started, the engineer should check the _____.	crankcase pressure	lube oil pressure	saltwater pressure	exhaust temperature	
14	764	D	One result of operating a diesel engine at light load with excessively low cooling water temperatures is a/an _____.	decrease in ignition lag	increase in fuel economy	reduction in lube oil viscosity	increase in cylinder misfiring	
14	765	C	Piping from booster pumps to injection systems are to be at least _____.	schedule 60	schedule 80	standard seamless steel	none of the above	
14	766	C	A "low pressure in oil outlet" alarm indication, as shown in the illustration, may be caused by _____.	the proper setting of valve V4	insufficient heating of the processed liquid	the three-way valve (V1) not opening	insignificant accumulations of sludge within the bowl assembly	See illustration number(s): MO-0127
14	767	A	The speed droop characteristics of two similar diesel engines, driving two similar DC generators, are connected in parallel. From the illustrated diagram, determine which of the following statements is true.	Engine "A" will take a greater part of the load than engine "B".	Engine "B" will operate at a lower RPM than engine "A" when operating alone.	Engine "A" will take lesser part of the load than Engine "B".	Engine "B" will operate at a higher RPM than engine "A".	See illustration number(s): MO-0109
14	768	D	The best method for determining the amount of eccentricity or offset misalignment between the disconnected propeller shaft coupling flange and the reduction gear output flange is by using a _____.	straight edge laid across the flange edges	thickness gauge between the separated flange faces	bridge gauge to check the position of each flange in relation to the other	dial indicator mounted on one flange indicating any misalignment of the other flange	
14	769	D	While operating the fuel oil centrifuge shown in the illustration, the bowl fails to open for sludge ejection. The probable cause is that _____.	one or more of the sludge ports is partially clogged	the operating water pressure is too high	the bowl disk set is clogged	the seal ring on the operating slide is defective	See illustration number(s): MO-0012
14	770	A	Hydraulic couplings will transmit torque equal to the input torque by means of energy changes in a rotating vortex of liquid. For the vortices to form, there must be _____.	slip between the impeller and runner	less than 2 per cent slip between the impeller and runner	axial thrust generated by the runner pinion shaft	momentary torsional vibration transmitted by the driving impeller	
14	771	C	In diesel engines designed with a crosshead, the motion of the piston rod can be described as _____.	reciprocating at the piston pin, rotary at the crank pin	reciprocating at the crank pin, rotary at the piston pin	straight reciprocation	straight rotation	
14	772	B	Which of the following will occur when the lower edge of the spiral, on the plunger of a jerk pump, uncovers the spill port?	The plunger immediately reverses direction.	The pressure drops and fuel delivery stops.	The plunger rotates to the no fuel position.	The barrel rotates to the zero effective stroke position.	
14	773	B	During the operation of the fuel oil centrifuge shown in the illustration, it is found that the "clean" oil discharge contains water. The most probable cause is the _____.	gravity disk is too large	throughput is too high	separating temperature is currently 95,C (203,F)	clean oil outlet valve has not been fully opened	See illustration number(s): MO-0012
14	774	D	If the jacket water temperature in an auxiliary diesel engine cooling system is lower than normal, the probable cause is _____.	air binding of the engine cooling system	a cracked water cooled exhaust manifold	blockage in the heat exchanger	faulty operation of the thermostat	
14	775	D	Before any work is done on a burner in an automatically fired auxiliary boiler, you should always _____.	block all control valves	allow the boiler to cool completely	lock all safety interlock switches closed	close all manually operated fuel valves	
14	776	A	If the a main propulsion diesel engine governor works irregularly with a jerking motion, a possible cause can be _____.	a sticking fuel control linkage	a malfunctioning overload cam	an unlocked overspeed trip	floating valves	
14	777	C	When reassembling the bowl of a disk-type centrifuge, the bowl or locking ring is rotated _____.	clockwise, due to the bowl rotating clockwise	clockwise, due to the bowl rotating counterclockwise	counterclockwise, due to the bowl rotating clockwise	counterclockwise, due to the bowl rotating counterclockwise	
14	778	A	An engine is equipped with the overspeed trip similar to that shown in the illustration. The throw out weight is designed to run at 900 RPM and trip out at 10% overspeed. However, the overspeed trip is currently activating at 930 RPM. In order to correct this problem, _____.	increase compression on spring #12	decrease compression on spring #12	install a larger throw out weight piece #10	change the angle of the operating face by machining piece #10	See illustration number(s): MO-0101

14	779	D	Pitting in the area close to the pitch line and on the same end of each gear tooth of a reduction gear unit would be caused by _____.	corrosion on the gears	excessive gear speed	dirt in the oil	misalignment of the gears	
14	780	A	There are two glands provided where the piston rod exits the cylinder shown in the illustration. The purpose of the top gland is to _____.	seal against scavenge air leakage	prevent crankcase oil leaking out	maintain crankcase vacuum	maintain crankcase pressure	See illustration number(s): MO-0003
14	781	D	Which of the components listed is only found in an opposed piston engine?	Exhaust valves	Scavenging ports	Combustion chambers	Double crankshafts	
14	782	C	In a jerk pump, the amount of fuel that will be forced through the spray nozzle on each upward stroke of the plunger depends on _____.	the pump supply pressure	the slope of the fuel cam	how the plunger is rotated	the number of sleeve segments engaged with the rack	
14	783	C	To guarantee that a reduction gear bearing is receiving proper oil supply, you should check the _____.	lube oil temperature at the cooler outlet	lube oil strainer magnets	bearing lube oil temperature	lube oil pressure to the bearing	
14	784	B	If the coolant temperature is excessively low as it passes through the internally cooled fuel injectors, the injectors may be damaged by _____.	water condensation in the fuel	corrosion of the nozzle tip	carbon deposits on the leakoff inlet	over lubrication of the needle valve	
14	785	D	Valves and fittings used with diesel engine fuel oil pressure piping may be threaded in sizes up to and including 60 mm O.D., but screwed unions _____.	are to be used on pressure lines in sizes 33 mm O.D. and over	over 33 mm O.D. will be permitted in lieu of flanged connections	shall not be used in any instance where the fitting is subjected to excessive vibration	are not to be used on pressure lines in sizes 33 mm O.D. and over	
14	786	A	If the regulating valve V4 shown in the illustration vibrated open, which of the following alarm conditions would be indicated at the program unit panel?	Low pressure in oil outlet.	Low oil temperature after preheater.	High oil temperature after preheater.	No discharge.	See illustration number(s): MO-0127
14	787	D	Constant capacity, pressure atomizing, fuel burners designed to meet a wide variation in steaming loads on an auxiliary boiler, are _____.	automatically supplied with warmer air on demand	automatically supplied with more fuel on demand	equipped with standard variable capacity atomizers	cycled on and off in response to steam demand	
14	788	D	Adjustments to the compensating needle valve in a hydraulic governor should be made with the engine at _____.	maximum power at a normal load	maximum power and load under normal conditions	half speed and normal temperature	normal operating temperature without a load	
14	789	B	Port "C" of the device shown in the illustration is used as the _____.	heavy phase discharge port	light phase discharge port	dirty oil inlet port	sealing water inlet port	See illustration number(s): MO-0012
14	790	C	The fuel oil strainers located in the fuel oil service system of an automatic auxiliary heating boiler are either the duplex type or the _____.	filter bag type	Perry filter type	simplex type	absorbent type	
14	791	D	Which of the following design features will reduce the possibility of overheating the top compression rings of a cast iron piston?	The top ring is located as close to the piston rim as possible.	The inside surface of the piston head is rounded into the ring belt.	A nickel-bearing insert is cast into the top ring groove.	A heat dam design is sometimes used in the piston head.	
14	792	D	In an electromagnetic slip coupling, the slip _____.	reduces magnetic pull caused by non-concentric electromagnets	reduces resonance and accentuates the turning moment irregularities	transmits electromagnetic flux through the primary circuit	generates the low frequency current which excites the secondary electromagnet	
14	793	C	Which of the listed diesel engine operating conditions should be checked immediately after any diesel engine is started?	Exhaust temperature	Lube oil level	Lube oil pressure	Water level in the expansion tank	
14	794	B	The component labeled "F" on the device shown in the illustration is known as the _____.	dosing ring	operating slide	paring disk	sliding bowl bottom	See illustration number(s): MO-0012
14	795	B	The boiler shown in the illustration would be classed as _____.	two-pass, scotch marine	single-pass, fire-tube, scotch marine	two-pass, water-tube	forced circulation, coil-type	See illustration number(s): MO-0064

14	796	C	Which of the following statements is correct concerning a hydraulic coupling?	Accurate alignment between the rotating members is extremely important.	Rapid declutching is impossible.	Torque is controlled by the volume of oil in the coupling.	Torsional vibrations from the engine are transmitted directly to the hull by the coupling.	
14	797	C	During extremely cold weather, while starting an engine, it turns too slowly and fails to start. This problem is most likely the result of _____.	high fuel oil viscosity	low fuel oil temperature	high lube oil viscosity	energized glow plugs	
14	798	C	When transmitted by a reduction gear, diesel engine speed is reduced and the torque available for work _____.	remains the same	is reduced	is increased	is eliminated	
14	799	B	Which of the couplings listed is normally not repairable, and is usually replaced if completely damaged?	Flexible disk-ring coupling	Gear-type coupling	Grid spring coupling	Block and jaw coupling	
14	800	B	Excessive wear at part #11, shown in the illustration would result in _____.	improper timing	increased oil consumption	lost compression	low oil pressure	See illustration number(s): MO-0027
14	801	B	The purpose of a heat dam used in some diesel engine cast iron pistons is to _____.	concentrate all heat in the piston crown	increase the distance of travel for heat from the crown to the top ring groove	ensure that all heat in the piston crown is conducted to the top ring	provide a short direct path for heat to flow from the crown to the top ring	
14	802	B	Load control on a diesel engine is accomplished by _____.	regulating the speed of the turbocharger	rotating the fuel injector pump plunger	regulating the speed of the fuel oil transfer pump	changing engine timing	
14	803	D	Immediately after starting a small high-speed diesel engine, you should check the _____.	cooling water temperature	lube oil temperature	fuel pressure	lube oil pressure	
14	804	D	Prolonged operation of a diesel engine with a closed cooling water system, at lower than normal designed operating temperatures can _____.	increase power output	decrease lube oil viscosity	eliminate fuel knock	cause sulfuric acid formation	
14	805	A	Valves used in diesel engine fuel oil pressure piping are to be _____.	so constructed as to permit packing under pressure	solenoid released upon the failure of engine lubrication	either of the gate or globe valve type	forge constructed under the approval of the Marine Inspector	
14	806	B	As shown in the illustration, which of the following conditions may be the cause for the "low pressure in oil outlet" alarm to be illuminated?	Vibration switch activated.	Faulty water solenoid valve.	Throughput too high.	All of the above are correct.	See illustration number(s): MO-0127
14	807	A	Regarding the water level electrode assembly shown in the illustration, normal water level would be indicated _____.	midway between arrows "B" and "C"	at arrow "B"	at arrow "C"	at arrow "D"	See illustration number(s): MO-0047
14	808	A	To increase the speed setting of the governor shown in the illustration, which of the listed adjustments must be made?	Increase the compression of the speeder spring.	Open the compensating needle valve.	Increase the load limit adjustment.	Compress the compensating dashpot spring.	See illustration number(s): MO-0096
14	809	C	The RPM of "A" is 100 and hobbed with 88 teeth. If gears "B", "C", and "D" have 66, 22, and 48 teeth respectively, the RPM of "D" in the gear train illustration is _____.	61.11 RPM	412.50 RPM	550.00 RPM	45.83 RPM	See illustration number(s): MO-0088
14	810	C	Auxiliary boilers are divided into several classifications, one of which is _____.	fire-tube controlled circulation	fire-tube supercritical circulation	water-tube natural circulation	water-tube express circulation	
14	811	C	Which statement correctly applies to the illustration?	The diagram shows a barrel piston.	The piston pin is free to rotate in the bushing.	The upper compression ring is protected from overheating by a heat dam.	The lower scraper rings are protected from overheating by a heat dam.	See illustration number(s): MO-0011
14	812	C	Movement of the pump control rack in a fuel injection system using individual plunger-type pumps _____.	changes the position of the fuel inlet ports	changes the length of the pump stroke	varies the quantity of fuel delivered	varies the compression of the delivery valve spring	
14	813	B	A diesel engine with a full speed of 1000 RPM drives a propeller at 300 RPM. What is the speed reduction ratio?	0.3 to 1	3.33 to 1	33 to 1	300 to 1	

14	814	A	A faulty thermostatic bypass valve, in a diesel engine cooling system, can result in _____.	excessive time required for warming-up	excessive freshwater corrosion	scale formation on the saltwater side	saltwater mixing with the freshwater	
14	815	C	Which of the listed governor characteristics will greatly affect the load sharing relationship between paralleled diesel generators?	Sensitivity	Power	Speed droop	Compensation	
14	816	B	Auxiliary boilers are divided into several classifications, one of which is _____.	water-tube supercritical circulation	water-tube forced circulation	fire-tube controlled circulation	fire-tube express circulation	
14	817	B	One of the most common causes of reduction gear failure is gear wear caused by scoring as a result of _____.	surface fatigue of the gears	an inadequate lube oil film	plastic flow of the gears	fretting corrosion from water contamination	
14	818	A	The purpose of the separating nozzle in the accumulator of a water-tube, coil-type, steam generator is to separate _____.	dry steam from the steam and water mixture	condensate from feedwater	superheated steam from saturated steam	sludge accumulations from feedwater	
14	819	A	A direct acting, pneumatically controlled governor for a diesel engine operates in a range of 10 to 50 psi. The fuel rack position is at 20 millimeters when the governor air pressure is 30 psi. If the governor air pressure changes to 20 psi, the fuel rack setting will change to _____.	13 millimeters	17 millimeters	22 millimeters	24 millimeters	
14	820	A	The major cause of trouble in a mechanical-hydraulic governor is contamination of the hydraulic fluid by _____.	dirt	fuel oil	governor cooling water	fuel oil tars	
14	821	D	Cast iron pistons used in large propulsion diesel engines are constructed with _____.	no taper what so ever	the skirt being tapered and smaller than the crown	the skirt being tapered and larger than the crown	the crown being tapered and smaller than the skirt	
14	822	C	The amount of fuel delivered by a unit injector is controlled by the _____.	camshaft	main spring	rack position	nozzle orifice size	
14	823	A	Which of the listed substances can be satisfactorily removed from diesel fuel by centrifuging?	Sludge	Gasoline	Fuel oil	Lube oil	
14	824	C	An emergency diesel generator cooling system is equipped with an automotive type thermostat. If the thermostat bellows loses its charge, the thermostat will _____.	open, and the coolant temperature will increase	open, and the coolant temperature will decrease	close, and the engine coolant temperature will increase	close, and the coolant temperature will decrease	
14	825	B	Which of the following statements is correct concerning ABS rules for fuel oil injection systems as found on diesel propelled vessels?	Check valves are to be located at the service tank and be so arranged as to be operable from the uppermost platform of the engine compartment.	Cut-out valves are to be located at the service tanks and be so arranged as to be operable from the engine room floor plates.	Strainers are to be provided in the fuel oil injection pump discharge line and shall be capable of being cleaned while the engine is in operation.	The injection line is to be of seamed drawn pipe and fittings are to be extra heavy.	
14	826	C	Which of the following steps should be taken if the "high oil temperature after preheater" LEDS, as shown in the illustration, are illuminated?	Increase temperature at the settling tank.	Re-adjust wing tank storage temperatures.	Confirm preheater set point temperature.	Adjust the PAS monitor and reset the proportional band controller.	See illustration number(s): MO-0127
14	827	A	Downcomers installed on auxiliary package boilers are protected from direct contact with hot gases by _____.	refractory and insulation	several rows of screen tubes	steel baffles	water wall tubes	
14	828	D	Pitted reduction gear teeth having a deep blue color with evidence of overheating have been operated with _____.	excessive speed	improper warm-up	extreme misalignment	inadequate lubrication	

14	829	A	Which of the listed problems will happen when the water level of a fire-tube type auxiliary boiler approaches the crown sheet?	The fusible plugs will melt.	The furnace will explode.	Excess steam will be generated.	The furnace will overheat.	
14	830	A	Compensating needle valve adjustments to a hydraulic governor should be made with the engine _____.	running at normal operating temperature without load	running at half speed and at normal temperature	running at maximum power and load under normal conditions	developing maximum power at normal load	
14	831	C	The upper section of a piston is called the _____.	land	skirt	crown	plate	
14	832	C	The effective pump stroke of an individual port-and-helix fuel injection pump is determined by the _____.	fuel delivery pressure	pump plunger diameter	plunger control rack position	total pump stroke	
14	833	B	A waterside fusible plug, installed in a fire-tube auxiliary boiler _____.	would be located in the center of the crown sheet and inserted from the fireside	by design, is drilled with a tapered hole so that boiler water pressure holds the fusible metal in the bronze body	is required by Coast Guard Regulations as an excess pressure relieving device	all of the above	
14	834	C	Which direction of rotation of the gear pump shown in the illustration will produce the correct direction of oil discharge to operate the governor? I. clockwise II. counterclockwise	I only	II only	Both I and II	Neither I nor II	See illustration number(s): MO-0092
14	835	A	Which of the following characteristics is true relative to meshing spur gears?	The gear of larger diameter will rotate at a slower RPM.	Both gears will operate in the same direction.	The teeth on the larger gear are larger than the teeth on the smaller gear.	Power can be transmitted at a 90° angle.	
14	836	C	A horizontal fire-tube package boiler, incorporating a two-pass design, is basically constructed with _____.	the rear of the boiler being used as a combustion chamber	extensive fireside baffling used to its fullest, enabling increased heat transfer rates	removable spiral metal gas retarders being inserted in the tubes to decrease the gas velocity to a minimum, thus extracting the maximum caloric heat value	all of the above	
14	837	B	Engine displacement is equal to the cylinder _____.	area times the stroke	area times the stroke, times the number of cylinders	volume times the stroke	volume times the stroke, times the number of cylinders	
14	838	C	When passing through mesh contact, the teeth of a reduction gear first go through a series of actions best described as _____.	galling	squeezing	sliding	slipping	
14	839	D	The fusible plugs used in fire-tube auxiliary boilers are installed in the _____.	furnace	corbell header	stay tube	crown sheet	
14	840	D	A main propulsion diesel engine is fitted with a pneumatically actuated governor, having an operating range of 10 to 60 psig. The current fuel rack setting is 15 mm at 30 psig. If the air pressure to the governor is increased to 40 psig, the fuel rack setting will change to _____.	10 mm	14 mm	15 mm	20 mm	
14	841	A	Why is the ring belt narrower in diameter than the skirt of a piston designed for a diesel engine?	To allow for greater expansion due to higher operating temperature.	To seal the cylinder against leakage of combustion gases.	To provide an additional surface for oil cooling.	To provide additional strength for the crown and lower structure.	
14	842	A	The amount of fuel delivered by a helical plunger type fuel injection pump is controlled by _____.	rotation of the pump plunger	rotation of the pump barrel	varying the pump supply pressure	varying the pump return pressure	

14	843	C	Cooling water pumps driven by direct-reversing diesel engines are usually _____.	curved impeller vane with tangential outlet	curved impeller vane with concentric outlet	straight impeller vane with concentric housing	straight impeller vane with tangential housing	
14	844	C	If the operating element of a thermostatic valve installed in a diesel engine cooling system malfunctions, it may result in _____.	a low level in the engine expansion tank	excessively high coolant pressure	improper temperatures	malfunctioning of the jacket water heater	
14	845	C	In a diesel engine, excessive cylinder liner wear will cause _____. I. increased blowby II. wear between the piston ring and groove	I only is correct	II only is correct	both I and II are correct	neither I or II are correct	
14	846	A	Part "M" of the device shown in the illustration shown, is referred to as the _____.	top or separating disk	intermediate disk	bottom disk	paring disk	See illustration number(s): MO-0012
14	847	B	In the past, the interior sides of most centrifugal purifier bowls were straight. However. the interior side of the bowl shown in the illustration, as compared to a straight interior vertical side bowl, is designed to _____.	allow a greater volume of sealing water to be carried	assist in the self-cleaning process	assist in reducing the thickness of the emulsion interface	eliminate the need for a discharge ring	See illustration number(s): MO-0012
14	848	D	To correct a hunting problem in a main propulsion diesel engine hydraulic governor, you should _____.	increase the governor oil pressure	adjust the speed droop setting	adjust the speeder spring travel	adjust the compensating needle valve	
14	849	A	The color of the engine exhaust from a diesel propelled ship should be _____.	clear	hazy light brown	hazy light blue	hazy light gray	
14	850	A	Which of the listed governor operating characteristics is considered to be isochronous?	Zero speed droop	Positive speed droop	Negative speed droop	Varying speed droop	
14	851	B	The diameter of a piston is usually less at the crown than at the skirt, in order to _____.	facilitate the installation of piston rings	allow for the expansion of the piston during operation	prevent crankcase vapors from entering the combustion chamber	reduce wearing of the upper cylinder liner	
14	852	A	On a diesel engine equipped with individual jerk type fuel pumps, adjustments should be made to the tappets (push rods) of the pumps to _____.	equalize effective delivery strokes	regulate combustion pressures	regulate exhaust temperatures	change from light to heavy fuel	
14	853	C	Which of the following manufacturing methods is recommended for diesel engine fuel injection line piping?	Cold rolled	Electric resistance welded	Seamless drawn	Straight seam	
14	854	C	The power output of a turbocharged diesel engine will drop if the cooling water flow through the aftercooler is interrupted because the _____.	turbocharger stalls	exhaust pressure increases	air charge density decreases	scavenge effect increases	
14	855	D	Which of the following conditions would cause the "high oil temperature after preheater" alarm as shown in the illustration to be indicated?	Overheating oil supply pump.	Properly operating steam trap.	Excessively fouled heat exchanger.	Steam control valve opened too far.	See illustration number(s): MO-0127
14	856	B	A burned exhaust valve may be detected by a higher than normal _____.	firing pressure	exhaust temperature from a particular cylinder	cooling water temperature	compression pressure	
14	857	C	Helical reduction gears, as used with main propulsion drive trains, are constructed so that several teeth are meshed at the same time to _____.	eliminate propeller shaft end thrust	translate heavy load into high speed output	provide smooth continuous power transmission	allow construction with fewer gear teeth	
14	858	C	What occurs in the combustion space of a diesel engine cylinder shortly after ignition and before the piston reaches TDC?	Rapid increase in temperature with constant pressure.	Rapid increase in pressure with constant temperature.	Rapid increase in pressure and temperature.	Rapid increase in volume and decrease in pressure.	
14	859	D	Successful combustion inside the cylinders of a diesel engine is dependent upon _____.	fine atomization	high temperature	good mixing of fuel and air	all of the above	
14	860	C	Which of the combustion parameters listed is used in a diesel engine, but NOT related to the injection system?	Atomization	Metering	Effective stroke	Penetration	
14	861	B	An advantage of aluminum pistons, when compared to cast iron pistons is _____.	greater high temperature strength	better heat conductivity	greater weight per cubic inch	increased resistance to wear	

14	862	B	The control rack to a unit injector regulates fuel delivery by _____.	altering spring tension on the plunger	rotating the helix of the plunger	regulating the lift of the check valve	altering the actual length of the plunger stroke	
14	863	D	The air bladder clutch used with some reversing reduction drive gears, consists of _____.	twin-disk clutch plates	jaw-type clutch plates	multi-plate friction plates with sliding collars	two independent clutches	
14	864	C	Which of the following conditions will develop if the flow of "raw" cooling water to a diesel engine is obstructed?	Air will enter the cooling system.	Carbon will plug the water cooled exhaust manifolds.	The jacket water temperature will rise.	The lube oil viscosity will increase.	
14	865	D	Which of the listed conditions will occur if a diesel engine exhaust valve is leaking?	Loss of compression for that cylinder	Misfiring or rough running	Damage to the valve	All of the above	
14	866	B	Fuel oil penetration into the cylinder of a diesel engine is _____.	dependent on air turbulence	reduced by finer atomization	increased by finer atomization	nonexistent in the precombustion chamber system	
14	867	D	Precombustion chambers, air cells, and energy cells in high-speed, small bore diesel engines all serve to increase _____.	firing pressure	ignition quality of fuel	fuel/air ratio during compression	turbulence	
14	868	B	Some medium and high-speed diesel engines require reduction gear units to provide a useful propeller speed. In most reduction gears, the bull gear _____.	must churn the oil in the sump	is connected to the propeller shaft	is driven at the highest RPM	compensates for alignment variations between the engine and pinion gear	
14	869	B	If the piston stroke in a diesel engine is 10 1/2 inches and the speed of rotation of the crankshaft is 720 RPM, what is the average piston speed?	1200 feet/minute	1260 feet/minute	1320 feet/minute	1380 feet/minute	
14	870	B	Which of the following statements best describes the operational characteristics of an isochronous governors?	They are suitable for use on main propulsion units.	They strive to maintain a constant prime mover speed for all values of steady load.	They cause a proportional drop in prime mover speed as the load is increased.	They have poor sensitivity at high RPM.	
14	871	A	Item #16 of the piston shown in the illustration is a/an _____.	thrust plate or thrust washer	piston carrier pin	oil drain passage	bearing insert tang	See illustration number(s): MO-0011
14	872	C	The fuel injection pumps on a diesel engine are controlled by a linkage system attached to the _____.	camshaft	crankshaft	governor	flywheel	
14	873	C	What type of fitting is to be used on diesel engine fuel injection line piping?	Mild steel	Hardened steel	Extra heavy	Double extra heavy	
14	874	B	Improper cooling of a diesel engine cylinder liner due to the accumulation of scale deposits, may cause _____.	low compression pressure	increased piston wear	increased cylinder lube oil consumption	poor contact between compression rings and liner	
14	875	A	Which of the following conditions would cause the "low temperature after preheater" alarm as shown in the illustration to be illuminated?	Steam supply pressure too low.	Specific gravity of the fuel too high.	Properly operating steam trap in discharge line.	Excessive phosphate treatment of the boiler water.	See illustration number(s): MO-0127
14	876	A	Diesel engine exhaust gas temperatures can be used to determine individual cylinder _____.	performance	horsepower output	fuel consumption	scavenge effect	
14	877	D	The volume of available air supply required by an air clutch varies with the _____.	size of the clutch	volume of the supply line between the control valve and the clutch	frequency of engagement	all of the above	
14	878	D	The principal characteristic of an isochronous governor is it will _____.	slow the machine down as the load is increased	shut down the engine if it overspeeds	display excessive speed droop	maintain a constant speed with variations of load	
14	879	D	Which statement about diesel engine combustion is true?	Combustion does not begin until the piston starts down on the power stroke.	Maximum combustion pressure is reached before TDC.	Turbulence in the cylinder causes a delay in ignition.	Maximum cylinder firing pressure is not developed until the piston passes TDC.	

14	880	D	High velocity turbulence is imparted to the air charge to the diesel engine, shown in the illustration, by _____.	masked intake valves	directional intake ports	a Mexican hat piston crown	a precombustion chamber	See illustration number(s): MO-0007
14	881	A	Which of the listed design features is most common to a two-stroke/cycle low-speed main propulsion diesel engines?	Crosshead construction	Cross-scavenging air flow	Trunk type pistons	Single reduction gearing	
14	882	C	Movement of the control rack of the fuel injector shown in the illustration, changes the _____.	fuel injection rate	fuel injection cycle	quantity of fuel injected	fuel pump delivery pressure	See illustration number(s): MO-0061
14	883	D	All of the diesel engine cylinder firing pressures are normal, yet all of the exhaust temperatures are low. Which of the following situations is responsible for this condition?	Excessively early injection timing	Combustion knock	Leaking piston rings	Light load	
14	884	B	Keel coolers fouled with marine growth, will result in _____.	higher raw water temperatures	higher jacket water temperatures	a malfunctioning thermostat	higher fuel temperature	
14	885	B	Proper atomization of fuel in diesel engine combustion chambers will _____.	affect the injection pressure	improve combustion	reduce compression pressure	decrease power output	
14	886	A	Modern marine diesel engines using mechanical fuel injectors operate on a combustion cycle which is _____.	a combination of constant volume and constant pressure	a combination of constant temperature and constant pressure	entirely constant pressure	entirely constant volume	
14	887	C	The function of the synchronizing motor on the generator governor illustrated is to _____.	drive the terminal shaft at a set speed	turn the governor drive shaft during start-up	provide remote control in speed adjustment	power the generator synchronizing lamps	See illustration number(s): MO-0092
14	888	A	The purpose of the device illustrated is to _____.	take firing and compression readings	remove moisture accumulation from the cylinder prior to starting	inject fuel oil into the cylinder	relieve excess pressure in the cylinder	See illustration number(s): MO-0031
14	889	B	Governors used on diesel engines to limit the load must be equipped with _____.	a fixed maximum fuel stop	a variable maximum fuel stop	pivotless centrifugal flyballs	a proportional action compensation mechanism	
14	890	A	The ability of a fuel particle to travel into the combustion chamber before burning is called _____.	penetration	permanence	turbulence	atomization	
14	891	D	The piston shown in the illustration is a _____.	double-acting barrel piston	single-acting barrel piston	double-acting trunk piston	single-acting trunk piston	See illustration number(s): MO-0011
14	892	A	The effective stroke of a constant-stroke, individual, fuel injection pump is varied by the _____.	control rack	delivery valve	governor speed	plunger crossbar	
14	893	B	The pinion gear shown in the illustration, is located _____.	nearest #1	near the middle of shaft #1 and #3	between #2 and #4	at #2	See illustration number(s): MO-0086
14	894	A	Insufficient piston cooling for a large, low-speed, main propulsion diesel engine burning heavy fuels, can result in _____.	high temperature corrosion and burning off of piston crown metal	dangerous thermal expansion of the piston skirt	excessive crosshead temperatures	change in fuel cetane number	
14	895	B	A piston in a four-stroke/cycle diesel engine makes four strokes during each _____.	crankshaft revolution	mechanical cycle of operation	period of two combustion cycles	cycle of two events	
14	896	B	The purpose of the ball-head unit shown in the illustration of the governor is to _____.	transmit fly weight movement to the floating lever	rotate the fly weights at a speed proportional to engine speed	transmit speeder spring compression to the fly weights	transmit speeder rod motion to the rotating bushing	See illustration number(s): MO-0092
14	897	A	Which of the operating functions listed applies to the clutch glands of the unit shown in the illustration?	The clutch glands are fitted with friction blocks.	When the ahead clutch gland is engaged, the astern clutch gland is not rotating.	Control air is supplied so that both clutch glands inflate simultaneously.	When the idle clutch gland is deflated, its friction blocks ride on the drum.	See illustration number(s): MO-0085
14	898	A	In the pressure-volume diagram shown in the illustration, fuel injection occurs at point _____.	c	d	e	f	See illustration number(s): MO-0035

14	899	A	The component labeled "O" on the device shown in the illustration is called the _____.	sliding bowl bottom	bottom disk	sludge separator	bowl body	See illustration number(s): MO-0012
14	900	A	The diesel engine valve subjected to most severe conditions of service is the _____.	cylinder exhaust valve	air starting valve	air inlet valve	cylinder relief valve	
14	901	B	The lower section of a piston is called the _____.	land	skirt	crown	plate	
14	902	A	The function of the window cast into the housing of an individual jerk pump is to _____.	allow the pump to be timed to the engine	check for sludge on the pump barrel	check that the fuel return passages are clear	set up the fuel rack calibration in cubic millimeters	
14	903	D	Which of the following conditions is most likely to occur if oil containing moisture is continuously fed to a purifier operating as a clarifier?	The purifier must be operated at a higher temperature.	The purifier must be operated at a higher speed.	The purifier will gradually change operation to separation.	The bowl will eventually fill with water.	
14	904	C	Scale and dirt accumulation in the waterside of a lube oil cooler will be indicated by a gradual increase in the lube oil _____.	TBN number	viscosity	temperature	foaming	
14	905	D	Which of the following statements is an accurate description of fuel injection piping used on diesel engines with a cylinder bore of 250 mm and above?	The piping shall be so arranged to allow for uncomplicated removal of the fuel injection equipment and other associated components located on the cylinder head.	All high pressure piping shall be of the double lined type, with the outer leakoff line suitably channeled to a dedicated tank.	All storage tanks connected to the leakoff piping of fuel injection systems shall be provided with high level alarms and sufficient means for emptying.	The piping is to be effectively shielded and secured to prevent fuel or fuel mist from reaching a source of ignition on the engine or its surroundings.	
14	906	B	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?	Improper steam trap selection.	Incorrect steam control valve setting.	Too high a temperature in settling tank.	Too low a temperature in day tank.	See illustration number(s): MO-0127
14	907	B	A change in the degree of fuel atomization in a diesel engine would most greatly affect _____.	air turbulence	fuel penetration	fuel spray angle	fuel injection rate	
14	908	C	Which of the following devices is a common basic element with nearly all mechanical governors?	Power piston	Control rack	Weights acted on by centrifugal force	Isochronous droop spring	
14	909	D	Theoretical perfect combustion in a diesel engine yields by-products of _____.	aldehydes and carbon dioxide	water vapor and carbon monoxide	nitrogen and carbon monoxide	water vapor and carbon dioxide	
14	910	C	Gear-type flexible couplings are often used in diesel engine drive trains because they _____.	require no lubrication under normal operating conditions	compensate for gross misalignment in the drive train	are able to transmit high torque, even where slight misalignment exists	will rapidly disconnect the engine from the line shaft	
14	911	B	The piston pin shown in the illustration should be classified as _____.	fixed	semi-floating	full floating	anchored	See illustration number(s): MO-0011
14	912	B	In order to determine the fuel pump rack setting for individual fuel pumps on the diesel engine shown in the illustration, you must _____.	secure the engine and remove the fuel pump crosshead cover	remove the fuel pump crosshead cover and observe the rack setting with the engine running	secure the engine, remove the fuel pump crosshead cover, and compare rack setting to master pump setting	run engine at idle, remove cover, and secure engine while observing rack movement	See illustration number(s): MO-0005
14	913	C	In a bypass type lubrication system for a diesel engine, the dirty oil line to the centrifuge should be taken from the _____.	lube oil pump suction line	lube oil pump discharge line	bottom of the lube oil sump	outlet from the lube oil header	
14	914	C	Which of the following factors tends to increase scale formation on the saltwater side of a heat exchanger used in a diesel engine cooling water system?	Baffle plates that have been bent during prior removal.	Leaks in the cooler tube nest.	Operating the engine while maintaining a high sea water outlet temperature.	A punctured sea water strainer supplying cooling water to the heat exchanger.	

14	915	A	If the peak to peak pressure pulsation in the diesel engine fuel injection return piping exceeds 285 psi what special provision is to be provided?	The piping shall be shielded and secured to prevent fuel or fuel mist from reaching a source of ignition on the engine or its surroundings.	The piping shall be directed to the fuel oil day tank, in addition it shall enter below the normal operating level of the tank.	Most diesel injection systems do not develop high pressures in their return lines due to regulations prohibiting installation of valves in these lines.	Return piping is required to be protected by relief valves which relieve to the diesel oil settling tank.	
14	916	D	Which of the following conditions would cause the LEDS for the alarm "emergency stopping or vibrations" shown in the illustration to illuminate?	Insufficient tighting of lock ring.	Improper cleaning of bowl.	Uneven sludge deposits in sludge space.	All of the above are correct.	See illustration number(s): MO-0127
14	917	D	Diesel engine exhaust temperatures may be used to indicate _____.	leaking exhaust valves	an overloaded cylinder	a clogged injector nozzle	all of the above	
14	918	A	In a diesel engine, a leaking exhaust valve can cause _____.	misfiring	preignition	interrupted scavenging	reduced scavenging	
14	919	D	Which of the following statements represents the correct operating sequence of events applied to the auxiliary diesel engine governor shown in the illustration?	If the governor spring (piece #7) breaks, the engine will dangerously overspeed.	When engine load increases, the governor weights (piece #9) turn faster.	If the centrifugal force developed by the rotation of the governor weights is equal to the force of the governor spring, the engine will stop.	When the centrifugal force developed by the rotation of the governor weights is substantially greater than the force of the governor spring, the fuel rack will decrease fuel.	See illustration number(s): MO-0094
14	920	C	When used with reversing reduction gears, medium-speed diesel engines should be bolted to their foundations with fitted bolts at the drive end and clearance (loosely fitted) bolts in other locations. This is done to _____.	maintain alignment when the ship's hull is working in heavy seas	ensure engine vibrations correspond to the natural frequency of the hull	permit the engine to expand away from the driven equipment as the engine heats up and expands	maintain engine thrust bearing clearances	
14	921	C	The piston wrist pin used in some diesel engine pistons is prevented from contacting the cylinder wall by a _____.	piston relief groove	piston pin cup	snap ring	bronze bushing	
14	922	C	In a diesel engine mechanical-type fuel pump, the delivery check valve is opened by _____.	push rod action	cam action	hydraulic action	spring action	
14	923	D	What is the term given to the process of breaking up fuel oil into very fine particles for better combustion?	Settling	Straining	Spraying	Atomizing	
14	924	D	The most severe cavitation erosion occurring on the waterside of diesel engine wet cylinder liners normally occurs _____.	throughout the lower one-half of the liner	throughout the upper one half of the liner	at TDC opposite the thrust side of the liner	near the middle of the thrust side of the liner	
14	925	A	Which of the coupling types listed is shown in the illustration?	Solid flange	Hydraulic flexible	Pneudraulic flexible	Fluid drive	See illustration number(s): MO-0087
14	926	B	For a given fuel, a change in the compression ratio will affect the ignition lag by which of the listed means?	An increase in compression ratio will increase the ignition lag.	An increase in compression ratio will decrease the ignition lag.	A decrease in compression ratio will decrease the ignition lag.	A decrease in ignition lag will increase the compression ratio.	
14	927	B	Turbulence in a diesel engine cylinder is of major importance in providing _____.	proper fuel metering	complete fuel/air mixing	minimal fuel penetration	proper fuel timing	
14	928	B	In the reduction gear set, shown in the illustration, the output shaft is located at #_____.	1	2	3	4	See illustration number(s): MO-0086
14	929	B	The required amount in the change of speed necessary before a governor will make a corrective movement is known as _____.	speed droop	sensitivity	stability	promptness	

14	930	B	Which of the following problems may occur if the opening pressure of a fuel injection nozzle is greater than specified by the engine manufacturer?	The amount of fuel injected will be increased.	The start of injection will be retarded.	The nozzle will permit fuel to dribble.	The spray pattern will be distorted.	
14	931	A	In a full floating wristpin, the pin is prevented from sliding against the cylinder walls by _____.	snap rings	seal welding	a press fitting	a tongue-and-groove	
14	932	A	Exhaust valve grooving and corrosion is caused by certain components of residual fuel oil. These components are sodium, sulfur, and _____.	vanadium	carbon	copper	ash	
14	933	B	Whether using a centrifuge or a simple filter, oil cleaning and filtration will be the most effective when the oil is at a _____.	high temperature and a high viscosity	high temperature and a low viscosity	low temperature and a high viscosity	low temperature and a low viscosity	
14	934	C	Cavitation erosion in the cooling water system of a diesel engine usually occurs at the pump impeller, and on the waterside of the _____.	fuel nozzle holders	exhaust valve guides	engine cylinder liners	engine exhaust manifold	
14	935	C	High firing pressures and a low exhaust temperature in a diesel engine may result from _____.	decreased piston to cylinder head clearance	increased exhaust system back pressure	early fuel injection timing	low scavenge air temperature	
14	936	B	Poor combustion in a diesel engine can be caused by _____.	high compression pressure	low intake air temperature	low exhaust pressure	high scavenge air pressure	
14	937	B	After each speed change, the compression of the diesel engine governor speeder spring is returned to a constant value, regardless of the amount of movement of the fuel control mechanism and engine load. Hence, this results in _____.	speed droop governing	isochronous governing	high sensitivity governing	relay-type governing	
14	938	B	Fuel oil discharged to the diesel engine cylinder is atomized at the _____.	turbocharger	injector nozzle tip	carburetor	fuel oil pump	
14	939	D	The longer the ignition delay period occurs in a diesel engine, the _____.	less fuel will enter the cylinder	lower will be cylinder compression temperatures	more complete will be fuel combustion	more rapid will be the rise in combustion pressure	
14	940	A	The load is always placed on the lower half of the main bearings in a/an _____.	two-stroke/cycle engine	four-stroke/cycle engine	reverse cycle engine	double acting engine	
14	941	B	Which term describes piston pins having bearing surfaces in both the piston bosses and connecting rod eye?	Stationary	Full floating	Semi-floating	Free rolling	
14	942	B	Diesel engine fuel oil leakage should be drained and additional precautions provided to _____.	return this oil to the proper storage tank	prevent contamination of lubricating oil by fuel oil	ascertain an accurate measurement of this leakage	drain cooling water system components	
14	943	C	As shown in the illustration, the alarm indicated by "emergency stopping or vibrations" may be caused by _____.	the rotating action of the centrifugal switch	new foundation bolt assemblies and dampeners	a failure to reset the emergency stop button	the emulsification of water and fuel within the parting chamber	See illustration number(s): MO-0127
14	944	C	The easiest way to locate a defective diesel engine exhaust valves is by _____.	taking compression readings	inspecting the valves visually	comparing exhaust pyrometer readings	listening to the engine	
14	945	D	Which of the following devices is common to both mechanical and hydraulic governors?	Direct linkage between the ball-head and fuel rack	A servomotor	A compensating device	Flyweights	
14	946	B	Which of the following conditions will tend to increase the ignition delay period of combustion in a compression ignition engine?	Using a fuel oil with a higher cetane number.	Decreasing the air charge temperature.	Reducing the injected fuel oil droplet size.	Increasing the compression ratio.	
14	947	B	In the reversing reduction gear shown in the illustration, the forward and reverse main pinions are in constant mesh with the main gear. This means the _____.	set that is clutched in will rotate as idlers driven from the main gear	idling gears rotate in a direction opposite to their rotation when carrying load	synchromesh coupling will maintain transition torque control	clutches are engaged by a reduction in control air pressure	See illustration number(s): MO-0085
14	948	A	A flexible coupling is located between the _____.	engine and the pinion	line shaft and tailshaft	pinion and the bull gear	thrust bearing and the worm gear	

14	949	B	Exhaust pyrometer readings provide an indication of the _____.	effectiveness of water-cooled exhaust elbows	distribution of the load between engine cylinders	amount of fuel penetration into the engine cylinders	indicated horsepower of the engine cylinders	
14	950	B	When is fuel injected into a cylinder of diesel engines?	Before air in the cylinder is compressed.	After air in the cylinder is compressed.	After combustion gases in the cylinder have expanded.	As air is taken into the cylinder.	
14	951	D	Part #15 of the piston shown in the illustration, is the _____.	heat dam	thrust washer	piston carrier	wrist pin	See illustration number(s): MO-0011
14	952	C	Injection lag can be caused by _____.	improper timing of the intake valves	setting of the pump plunger	compressibility of the fuel	position of the needle valve	
14	953	B	To manually bypass a strainer or filter in a shunt type lube oil filtering system, _____.	first, parallel the drain lines	turn the three-way valve	open the bypass valve and then close the isolation valves	close the isolation valves and then open the bypass valve	
14	954	B	If the raw water supply pressure for a diesel engine cooling system is below normal, you should check for a _____.	broken thermostat	clogged sea strainer	blown head gasket	cracked head	
14	955	D	A change in the degree of fuel atomization in a diesel engine cylinder has the greatest effect on the _____.	cylinder air turbulence	fuel spray angle	fuel injection rate	combustion in that cylinder	
14	956	C	In most marine single reduction gear units, the bull gear is driven by the _____.	quill shaft	helical gear	pinion gear	spur gear	
14	957	D	The rate of pressure rise during the period following fuel ignition process in a diesel engine, is influenced chiefly by the _____.	percent of CO2	range of inflammability	theoretical fuel/air ratio	length of the ignition delay period	
14	958	A	A change in engine speed is required before a governor is able to make a corrective movement of fuel rack. This aspect of governing is commonly expressed as a percent and is known as _____.	governor sensitivity	governor promptness	speed droop	isochronous governing	
14	959	A	On most diesel engines, the governor controls the output speed by _____.	controlling the amount of fuel injected into the cylinders	varying the speed of the turbocharger	adjusting the compression ratio	changing the timing of the fuel injection camshaft	
14	960	D	Proper dispersion of fuel in a diesel engine cylinder is dependent upon the _____.	injection pressure	shape of combustion space	turbulence in combustion space	all of the above	
14	961	B	Piston cooling fins are located _____.	on top of the piston crown	underneath the piston crown	at the base of the piston skirt	inside the cylinder liner cooling water jacket	
14	962	A	Compared to other fuel injection systems, unit injectors operate with virtually no _____.	injection lag	ignition delay	moving parts	control	
14	963	A	When cleaning a duplex strainer, it is important for _____.	the pressure to be bled prior to opening the compartment cover	the lube oil to be allowed to cool before removing the basket	the cleaning fluid used to be more viscous than the lube oil	a new cover gasket to be installed when reassembling the unit	
14	964	D	In a closed cooling water system, which of the following problems can cause the water pressure to fluctuate?	An open vent in the cooling system.	A fouled sea chest.	A restricted water passage in the engine.	Air entrained in the cooling water.	
14	965	A	If uneven sludge deposits accumulate in the sludge space of the bowl assembly of the device shown in the illustration, _____.	an alarm for "emergency stopping or vibrations" may be indicated	the machine will continue to operate indefinitely	the shoot cycle should be automatically be initiated at more frequent intervals	there are excessive quantities of mirco-organisms in the fuel supply	See illustration number(s): MO-0127
14	967	A	Why is it necessary to compress the air charge in the cylinders of a diesel engine?	To ignite the fuel.	To insure pumpimg losses are held to a minimum.	To increase fuel consumption.	To keep exhaust temperature low.	

14	968	C	The average exhaust temperature of a two-stroke/cycle diesel engine with a turbine-driven supercharger is lower than a similar four-stroke/cycle diesel engine at equal loads because _____.	two-stroke/cycle diesel engines have a higher M.E.P. than four-stroke/cycle diesel engines	four-stroke/cycle diesel engine exhaust is cooled by scavenging air	two-stroke/cycle diesel engines have a lower M.E.P. than four-stroke/cycle diesel engines	the opening of the two-stroke/cycle diesel exhaust ports or valves occurs much later than in four-stroke/cycle diesel engines	
14	969	C	Diesel fuel oil having a low cetane rating can result in _____.	improved cold weather starting	smoother engine operation	combustion knock	reduce ignition lag	
14	970	A	Clutching takes place nearest the bearing shown in the illustration, located at #_____.	1	2	3	4	See illustration number(s): MO-0086
14	971	B	Besides the use of piston cooling fins to assist in cooling, they also provide extra strength for the piston _____.	skirt	crown	wrist pin	oil rings	
14	972	B	Differential needle valves used in fuel injectors are directly closed by _____.	cam action	spring force	fuel oil pressure	firing pressure	
14	973	D	A dirty lube oil strainer can result in _____.	crankcase dilution	low lube oil temperature	excessive oil consumption	low bearing oil pressure	
14	974	A	In a closed cooling system for a turbocharged, four-stroke/cycle diesel engine, fluctuating water pressure can be caused by _____.	improper venting of the cooling system	carrying the expansion tank water level too high	a totally clogged impeller in the cooling water pump	an incorrectly set cooling system temperature control	
14	975	D	In the set of reduction gears shown in the illustration, what type of bearing is used?	Ball	Babbitt	Sleeved	Tapered roller	See illustration number(s): MO-0086
14	976	C	The governor controlling a diesel engine modulates crankshaft RPM by adjusting the _____.	intake air supply	turbocharger speed	fuel injection pumps	engine speed droop	
14	977	A	High exhaust temperature and black smoke exhausting from an auxiliary diesel engine can be caused by _____.	engine overload	low combustion temperature	plugged fuel nozzle holes	excessive compression pressure	
14	978	C	Individual cylinder performance in a diesel engine is routinely determined by exhaust gas _____.	chemical analysis	pressure readings	pyrometer readings	infrared analysis	
14	979	A	Any increase in the exhaust back pressure of a four-stroke/cycle diesel engine will _____.	reduce engine horsepower output	aid in silencing the exhaust noise	increase the mean effective pressure	contribute to effective cylinder scavenging	
14	980	D	The driving force of a propeller is transmitted to the hull through the_____.	bevel gear teeth	helically cut gear teeth	sleeve bearings	thrust bearing	
14	981	C	The purpose of the drilled passages in the crown of the piston shown in item "S" the illustration is to _____.	provide cooling for the piston	supply oil to the cylinder liner	allow excess oil from the liner to drain back to the sump	provide cooling for the control ring groove	See illustration number(s): MO-0013
14	982	A	If fuel injection to a four-stroke/cycle diesel engine begins earlier than designed, ignition may be delayed because the _____.	cylinder compression pressure may not be high enough	cylinder compression temperature may be too high	fuel oil injection pressure may not be high enough	scavenge and purge process is incomplete	
14	983	A	In a full flow type lube oil system, the bypass relief valve will lift due to _____.	a clogged filter element	excessive lube oil pump discharge pressure	excessive lube oil flow	excessively hot lube oil	
14	984	B	Which of the following problems can cause fluctuating pressures in the closed cooling system of a main propulsion diesel engine?	Defective temperature controls in the system.	Cavitation in the cooling water pump.	Opened vent in the cooling system.	Restricted water passages in the engine.	
14	985	C	Which of the following statements is correct concerning diesel engine cooling water systems?	Each engine must have its own engine driven cooling water pump capable of providing cooling for all ranges of operation.	Propulsion engines with bores exceeding 200 mm are to be fitted with a means to display the cooling water temperature of each cylinder.	At least two independent sea suctions are to be provided for supplying water to the engine jackets or to the heat exchangers.	Suitable strainers are to be fitted between the circulating pumps and heat exchangers when sea water is used for direct cooling.	

14	986	B	Which of the following conditions will occur if the height position of the paring disc or bowl spindle is incorrect in the device shown in the illustration?	The separator will fail to reach rated speed.	An alarm for "emergency stopping or vibrations" may be indicated by the program unit alarm panel.	The unit will experience substantial damage.	None of the above are correct.	See illustration number(s): MO-0127
14	987	C	Sensitivity for a diesel engine governor is described as the _____.	governor's speed of response to variations in engine load	ability to maintain desired engine speed without speed fluctuation	percent of speed change necessary for corrective action by the fuel control	ability to maintain constant speed regardless of engine load	
14	988	B	Which of the following statements concerning the factors affecting ignition delay is correct?	An increase in intake air temperature will increase ignition delay.	An increase in coolant temperature will decrease ignition delay.	An increase in combustion chamber turbulence will increase ignition delay.	An increase in compression ratio will increase ignition delay.	
14	989	C	Air motion is induced in a four-stroke/cycle diesel engine cylinder to improve air fuel mixing, and is known as _____.	supercharging	scavenging	turbulence	swept volume charging	
14	990	B	Maintaining the proper fuel oil temperature will result in _____.	the elimination of valve wear	improved atomization	a decrease in cylinder blow-by	an increase in cylinder blow-by	
14	991	B	Trunk type diesel engine pistons are effectively cooled when heat is _____.	radiated through the engine block	transferred to water cooled cylinder walls	conducted through the piston crown	transferred to escaping exhaust gases	
14	992	B	The minimum fuel oil delivery pressure required for efficient injection depends primarily on the _____.	degree of cylinder air turbulence	maximum pressure in the engine cylinders during injection	quantity of the fuel to be injected	duration of the ignition delay period	
14	993	B	An increased pressure differential between the inlet and outlet of a strainer usually indicates the strainer is _____.	holed	fouled	clean	dry	
14	994	B	A diesel engine with a combustion chamber located between the crowns of two pistons is known as a/an _____.	double-acting engine	opposed pistons engine	single-acting engine	horizontal acting engine	
14	995	C	In a diesel engine, crosshatch on the liner surface aids in _____. I. rapid ring seating II. the retention of lube oil	I only is correct	II only is correct	both I and II are correct	neither I or II are correct	
14	996	B	Persistent knocking in one cylinder of an eight cylinder diesel engine would MOST likely be caused by _____.	using fuel oil with low cetane number	a badly worn piston pin	a loose flywheel key	a loose bed plate bolt	
14	997	D	To successfully reduce an excessively high diesel engine exhaust gas temperature, you should _____.	reduce the engine driven fuel pump outlet pressure	retard the fuel injector timing to reduce power	increase the fuel rack setting	reduce the load on the engine	
14	998	A	Which of the two events listed occurs simultaneously in a two-stroke/cycle diesel engine?	Exhaust and scavenging	Scavenging and compression	Ignition and expansion	Exhaust and compression	
14	999	C	High exhaust back pressure will result in an increase in _____.	turbocharger efficiency	engine power output	carbon deposits on fuel injectors	cylinder scavenging	
14	1000	B	The governor for an emergency diesel generator is shown in the illustration. A large change in load will result in a change in engine speed, which of the parts listed will be the FIRST governor component to react to the change in load?	Piece #8	Piece #9	Piece #13	Piece #21	See illustration number(s): MO-0094

14	1001	B	A loop or cross scavenged engine utilizes the motion of its pistons and a turbocharger to provide scavenging air. Which of the listed mechanical designs prevents the air under the pistons from being pumped back through the scavenge ports during the piston power stroke?	Masked intake ports	Length of the piston skirt	Positive pressure from the blower	Lower liner seals	
14	1002	C	Which of the following statements concerning a closed type fuel injection nozzle is true?	The hole type of a closed nozzle is self-cleaning.	Multi-hole type nozzles are only suitable for use in engines with precombustion chambers.	Most closed nozzles open inward under the pressure acting on the differential area of the needle valve.	The pintle type nozzles are most susceptible to carbon deposits building up in and around the orifice.	
14	1003	D	To determine if the lube oil filter elements need changing, _____.	open the filter and inspect the elements	check the lube oil pump discharge pressure	check the lube oil header pressure	check the pressure drop across the filter	
14	1004	B	Combustion gas venting through the expansion tank can be caused by a _____.	leaking oil cooler	cracked cylinder head	leaking exhaust valve	worn piston ring	
14	1005	B	Diesel engine control can be obtained by the bridge _____.	at any time	only after the engine room control station is switched to "bridge control"	whenever the secondary station is switched to "bridge control"	with the approval of the chief engineer only	
14	1006	C	The direct cause of a crankcase explosion can be attributed to _____.	extremely hot scavenge air	excessive cooling water temperature	an overheated bearing	excessive lube oil in the crankcase	
14	1007	D	Which of the following statements is correct for the design and installation of diesel engine cooling water systems?	An alarm device with audible and visible signals is required for all cooling water systems.	Propulsion engines with bores over 200 mm are to be fitted with cooling water thermometers at each cylinder.	Each totally enclosed cooling system shall be provided with a suitable head tank.	Drain cocks are to be provided at the lowest points of all cylinder water jackets.	
14	1008	D	If the separator shown in the illustration vibrates excessively, an alarm indicating "emergency stopping or vibrations" will be illuminated. Which of the following conditions may cause this situation?	The bowl spindle is bent.	The vibration-damping rubber washers are damaged.	The top bearing spring is broken.	All of the above are correct.	See illustration number(s): MO-0127
14	1009	D	If the instrument sensing element, shown in the illustration, became coated with foreign matter, which of the listed conditions would be likely to occur?	Immediate damage to the porcelain insulator.	High temperatures developing in the exhaust.	Damage to the pyrometer.	Inaccurate temperature readings.	See illustration number(s): MO-0075
14	1010	C	Combustion knock can occur in the cylinders of a diesel engine under any condition permitting _____.	a shortened ignition delay period	a lean fuel/air mixture	excess fuel in the combustion chamber	rapid vaporization of injected fuel droplets	
14	1011	C	One of the most common methods in preventing a diesel engine piston pin from contacting the cylinder wall is by the use of _____.	non-floating pin	tape rod bosses	snap rings	offset drilling	
14	1012	D	The injection pressure of a hydraulic fuel injection nozzle can be increased by _____.	increasing fuel oil booster pump pressure	increasing the injector nozzle orifice size	removing shims from under the nozzle spring	increasing compression on the pressure spring	
14	1013	A	Many lube oil filters have pressure gages installed on both the inlet and outlet in order to indicate the pressure drop across the filter. In normal operation, the pressure drop will _____.	slowly increase	slowly decrease	remain the same	have no effect on filter operation	
14	1014	C	A cracked cylinder head on a diesel engine may be indicated by _____.	excessive lube oil consumption	water draining from the fuel leak off valves	combustion gases venting at the expansion tank	excessive fuel oil consumption	
14	1015	B	Control of the main propulsion diesel engines can be shifted from the engine room to the wheelhouse from the _____.	wheelhouse control station	engine room control station	captain's office	chief engineer's office	

14	1016	B	The possibility of a diesel engine crankcase explosion will be increased by operating an engine _____.	with a crankcase vacuum between 1.5" and 2" of water	with a leaking crankcase inspection cover gasket	equipped with a crankcase exhaust blower which vents to fresh air	equipped with a turbocharger which utilizes a gear drive	
14	1017	A	Exhaust pipes of multiple engine installations are not to be interconnected, but are to be run separately to the atmosphere _____.	unless arranged to prevent the return of gases to an idle engine	to a point not lower than the highest load line	at a location segregated from other ventilation systems	and shall be protected by a rain guard or similar device	
14	1018	C	If the control unit as shown in the illustration indicates alarm A01 "abnormal water content", the operator should suspect _____.	that the operating water tank is about to overflow	that the bowl is fouled and cleaning is necessary	an extremely high percentage of water in the fuel	faulty seals between the sliding bowl bottom and the paring disc assembly	See illustration number(s): MO-0127
14	1019	C	Excessive diesel engine cylinder exhaust back pressure will be caused by _____.	slight timing discrepancies	heavy fuel injection	an obstruction in the exhaust silencer	a fouled intake manifold	
14	1020	A	A thrust bearing is used with a propulsion diesel engine to _____.	control axial movement of the crankshaft	transmit engine thrust to the propeller shaft	absorb vibrations in the propeller shafting	prevent propeller thrust from being transmitted to the hull	
14	1021	C	In a large slow-speed propulsion diesel engine, the force applied to the piston is _____.	against the crosshead during power stroke and away from the crosshead during the compression stroke	against the crosshead during the compression stroke and away from the crosshead during the power stroke	against the crosshead during the power and compression strokes	away from the crosshead during the power and compression strokes	
14	1022	D	Fuel supplied by each unit injector on a two-stroke/cycle single acting diesel engine is directed into each cylinder at a very high pressure through the _____.	high pressure fuel line	spill deflector	check valve	spray tip of the injector	
14	1023	C	Turbulence of the compressed air charge in a diesel engine cylinder increases _____.	ignition lag	piston side thrust	the efficiency of the engine	compression pressure	
14	1024	B	A cracked cylinder head in an operating engine may be indicated by _____.	a steady flow of water from the expansion tank vent	combustion gases venting at the expansion tank	lower temperature at the cylinder head water discharge	water draining from the fuel leakoff lines	
14	1025	D	Combustion knock occurring in a diesel engine can be caused by _____.	excessive fuel penetration	prolonged injection lag	reduced ignition lag	prolonged ignition lag	
14	1026	D	Which of the following problems could develop due to the accumulation of oil vapors in the crankcase of a diesel engine?	Reduced lubrication	Poor fuel economy	Combustion knock	Crankcase explosion	
14	1027	B	Which of the following statements is a description of the combustion cycle?	The mechanics of engine operation.	The heat process which produces the force to initiate the movement of the engine parts.	The number of piston strokes involved.	The mechanical equivalent of heat.	
14	1028	D	The time between injection and ignition of the fuel is known as _____.	turbulence lag	after burning ratio	preignition lag	ignition delay	
14	1029	D	In using reduction gears to obtain efficient propeller speeds, _____.	they must be located at the after end of the engine	they can only be used with one engine at a time	they eliminate the need for controllable pitch propellers	they are connected to the engine with a flexible coupling	
14	1030	C	The purpose of the rotating seal located at the aft end of the reversing reduction gear shown in the illustration, is to _____.	provide lube oil to the gears	attach a tachometer to indicate relative speed	provide operating air pressure to the clutch glands	prevent lube oil from leaking out of the gear case from the roller bearings	See illustration number(s): MO-0085
14	1031	A	During the power stroke, the side thrust of a trunk type piston is a result of the angle _____.	formed by the connecting rod and the cylinder center line	formed by the piston in relation to the piston pin	between the crankarm and crankpin	between the master and link connecting rods	

14	1032	D	One problem resulting from a diesel engine fuel injector opening pressure being lower than specified by the engine manufacturer, is that the _____.	start of injection will always be retarded	duration of injection will always be reduced	quantity of fuel injected will always be decreased	quantity of fuel injected tends to be increased	
14	1033	B	Lube oil cannot be efficiently filtered if its _____.	viscosity is too low	temperature is too low	pump discharge pressure is higher than the system's pressure	pump capacity is greater than the system's needs	
14	1034	D	A crack in a cylinder liner can be caused by _____.	worn piston rings	installation of undersized sealing rings	operating the engine at low loads	restricted cooling water passages	
14	1035	B	An exhaust pipe from a internal combustion engine may not need to be insulated when _____.	installed on fishing vessels	it is of the water jacketed type	it is used as an emergency generator	special provision is made by the Chief Engineer	
14	1036	A	When oil vapor, oxygen and hot spots are present at the same time within a crankcase, which of the following hazards could develop?	Explosion	Implosion	Misfire	Dieseling	
14	1037	A	Which of the following conditions may be the cause of the alarm "drain valve insufficient" being indicated on the control unit of the device shown in the illustration?	Water content in oil feed extremely high.	No discharge feedback signal from EPC 30.	Back pressure in oil outlet too high.	Oil density too high due to low operating temperatures.	See illustration number(s): MO-0127
14	1038	C	For a given size engine, the two-stroke/cycle diesel engine will deliver more power than a four-stroke/cycle diesel engine because _____.	it has a longer power stroke	more air gets into the cylinder each stroke	it develops twice as many power strokes at the same speed	higher combustion pressure is developed	
14	1039	D	A sudden drop in diesel engine cylinder compression pressure can be caused by _____.	a leaking fuel injector nozzle	a clogged air filter	excessively early fuel injection	malfunctioning valves	
14	1040	D	The governor for an auxiliary diesel engine is shown in the illustration. Which of the pieces listed rotates proportionally to engine speed?	"1"	"3"	"21"	"2"	See illustration number(s): MO-0094
14	1041	A	Ring groove inserts are occasionally used on aluminum alloy pistons to _____.	reduce the ring groove wear rate	seal against crankcase vapors	lessen the wear on aluminum parts of the cylinder	allow for the greater expansion rate of aluminum	
14	1042	D	The minimum speed an engine must attain before ignition can occur depends upon _____.	the type and size of the engine	the condition of the engine	ambient temperature	all of the above	
14	1043	A	Lube oil filters remove contaminants from oil more efficiently if the oil being filtered is _____.	heated to reduce viscosity	cooled to increase viscosity	pumped rapidly through the filter	pumped through the filter under high pressure	
14	1044	D	Coolant can be lost from a diesel engine jacket cooling water system by leakage from _____.	cylinder head cracks	piping joints	pump seals leaking	all of the above	
14	1045	C	An automated diesel engine should normally shut down due to _____.	low lube oil temperature	high ambient air temperature	low lube oil pressure	high exhaust system back pressure	
14	1046	B	Which of the listed conditions is most likely to cause a crankcase explosion?	A high cooling water temperature	Fuel dilution of the lube oil	Excessive engine speeds	Improper lube oil viscosity	
14	1047	C	Which of the following statements pertains to propulsion engines with bores exceeding 200 mm?	There shall be a means to display the cooling water outlet temperature of each cylinder.	All engines connected to controllable pitch propellers shall be of the direct reversible type.	The engines will be fitted with a means to display the exhaust gas temperature of each cylinder.	All of the above are correct.	
14	1048	D	Which of the following conditions can be a cause for the control unit of the separator shown in the illustration to indicate alarm A06?	Back pressure oil outlet is too high.	Leakage from the sealing ring occurs in the bowl periphery.	No cooling air supply is provided to the liquid sensor.	All of the above are correct.	See illustration number(s): MO-0127
14	1049	C	A V-12 four-stroke/cycle 500 horsepower diesel engine is operating under a normal load, the firing pressures are low and the exhaust temperatures are high. Which of the following problems is the most probable cause of this condition?	Fuel pump rack setting is too far out.	The air intake filter is missing.	The exhaust back pressure is too high.	The fuel pump rack setting is too far in.	

14	1050	D	An overcorrecting and unstable engine governor operation is known as _____.	droop	dead banding	dash potting	hunting	
14	1051	C	What is the function of an engine's stationary parts?	To add power to the engine.	To keep the engine firmly attached to its supporting base.	To keep moving engine parts in their proper relative positions.	To rotate the crankshaft.	
14	1052	C	Proper filtering and straining of diesel fuel is important because the _____.	fuel oil pump will overspeed if dirt is not removed	fuel oil transfer pumps cannot tolerate small amounts of grit in the oil	fuel injectors may be damaged by foreign particles in the fuel oil	dirty fuel will clog the intake air filter	
14	1053	C	Lube oil filters remove contaminants more efficiently if the oil being filtered is _____.	under high pressure	under low pressure	heated to reduce viscosity	cooled to increase viscosity	
14	1054	B	Increasing the oil pressure acting on the power piston of the hydraulic governor shown in the illustration will _____.	require the overspeed trip setting to be adjusted	increase the governor output power	increase the speed droop	decrease the speed droop	
14	1055	D	Diesel engine automated control systems may utilize sensing devices of dual function, with sensing ranges providing both alarm and engine shut down capability. Which of the key points listed would only require an alarm sensor?	Lube oil pressure and temperature	Jacket water pressure and temperature	Engine overspeed	Lube oil sump level	
14	1056	D	Crankcase explosions in propulsion diesel engines result from _____.	the splashing of lubrication oil by the crankshaft	the dilution of crankcase oil with particles of combustion	broken fuel lines spraying oil on the crankcase	the ignition of unburned fuel and air in the crankcase	
14	1057	A	Which of the combustion chambers shown in the illustration is referred to as an "energy cell" used in some small diesel engines?	A	B	C	D	See illustration number(s): MO-0068
14	1058	A	Combustion knock occurring in a diesel engine can be caused by _____.	low coolant temperature	insufficient fuel	high ambient temperature	carbon buildup on the injector tips	
14	1059	C	Which of the items listed causes a direct acting mechanical governor to operate the engine fuel control linkage?	Hydraulic oil pressure	Servomotor action	Flyweight centrifugal force	Relay motion	
14	1060	A	The diesel engine shown in the illustration can be fitted with a pyrometer at each exhaust elbow. If one of the cylinder pyrometers is reading significantly higher than the others, which of the following should be your FIRST action?	Check the pump rack setting.	Examine the water outlet header for evidence of blockage.	Replace the fuel injector nozzle.	Examine the exhaust valves for evidence of burning.	See illustration number(s): MO-0005
14	1061	A	Thin bronze rings are inserted in the face of some chromium plated piston rings to _____.	promote piston ring seating in the cylinder	prevent rapid wear on the ring face	provide better lubrication of the piston ring	produce an even glaze on the cylinder	
14	1062	D	The two strokes of a two-stroke/cycle diesel engine are _____.	power and intake	intake and exhaust	exhaust and compression	compression and power	
14	1063	B	Reduction gear casings are vented in order to _____.	allow windage to exist for cooling the gears	avoid a buildup of pressure within the gear case	avoid lube oil foaming within the case	allow for proper lubrication of the friction clutch shoes	
14	1064	B	Which of the conditions listed may occur in an operating diesel engine if air pockets form within the cylinder head circulating water passages?	Hydraulic stress and distortion will develop.	Hot spots will develop.	Fuel oil viscosity will increased.	An increase in trapped deposits of scale and dirt.	
14	1065	D	Air receivers installed in starting air systems are to be _____.	cylindrical in shape with service connections located at the top and bottom	opened and made available for inspection during biannual inspections	provided with automatic drain traps for the removal of moisture	so installed as to make the drain connections effective under extreme conditions of trim	

14	1066	B	Critical speed in diesel engines occurs when engine torque pulsations become _____.	opposed to the crankshaft rocking couple	resonant with the crankshaft natural frequency	critical fore and aft crankshaft vibrations	horizontal whipping motions of the crankshaft	
14	1067	B	If the main sealing ring in the bowl periphery begins to leak, which alarm will be indicated by the control unit of the device shown in the illustration?	AO1: abnormal water content.	A06: liquid indication.	Low pressure in oil inlet.	Low pressure in oil outlet.	See illustration number(s): MO-0127
14	1068	C	In the Otto cycle, the fuel/air mixture is ignited at what point and by what means?	At TDC by heat generated by compression.	Just before TDC by heat generated by compression.	Just before TDC by spark ignition.	At TDC by spark ignition.	
14	1069	B	Which of the listed reasons is the most likely cause of a sudden drop in compression pressure in one diesel engine cylinder?	Missing filter segment of an intake filter	Malfunctioning valves	Leaking fuel injector nozzle	Excessively early fuel injection	
14	1070	B	What is the function of the main thrust bearing?	Prevents lateral movement of the slow speed gear.	Transmits propeller thrust to the hull.	Keeps spring bearings in line.	Prevents main reduction gear axial movement.	
14	1071	A	Which of the construction techniques listed is used on new piston rings to facilitate run-in or seating?	Special ring facings, such as a thin bearing surface of antifriction metal.	The oil control ring face is machined at an angle of 10 degrees.	The ring diameter, when free, is machined slightly smaller than the cylinder bore to allow for expansion at high combustion temperatures.	Oil control rings maintain continuous oil film.	
14	1072	B	Heat damage to fuel injection nozzles can be prevented by avoiding _____.	excessive fuel oil temperature	long periods of engine overload	metallic contact between nozzles and cylinder heads	hard carbon deposit and varnish on the nozzles	
14	1073	C	How is the illustrated strainer element cleaned during engine operation?	The drain plug is removed and the housing is drained.	The housing is removed and the element is cleaned with a solvent.	The T-handle is rotated.	The strainer element is removed, cleaned in kerosene or solvent, and dried with an air brush.	See illustration number(s): MO-0057
14	1074	D	Failure to ensure proper venting of the cooling system of a diesel engine can result in _____.	excessive air charge density	priming in the expansion tank	failure of raw water pump shaft seals	local overheating and/or internal corrosion	
14	1075	D	In a diesel engine, the time period between fuel injection and ignition is usually defined as _____.	injection duration	ignition timing	precombustion lag	ignition delay	
14	1076	B	Failure to open the diesel engine test cocks after a long period of shutdown, prior to starting may result in _____.	an air bound fuel system	damage to cylinder heads and pistons	excessive fuel injection	excessive air valve lift	
14	1077	D	The knock occurring when a cold diesel engine is started and continues while running at low speed, but stops when the engine reaches normal operating speed and temperature, is _____.	caused by retarded injection timing	caused by a mechanical defect in one cylinder	caused by high fuel injection pressures	normal for these conditions	
14	1078	A	When the diesel engine hydraulic governor shown in the illustration is operating at controlled speed, which of the relationships listed will occur between the edges of the pilot valve and the ports of the pilot valve bushings?	The edges register with and just close off the ports without allowing oil flow.	The edges are above the ports and oil under pressure supplies the power piston.	The edges are above the ports and oil bleeds to the sump.	The edges are in constant motion going both above and below the ports and governor stability is maintained.	See illustration number(s): MO-0092
14	1079	C	If a diesel engine's exhaust temperature is abnormally high, the cause could be _____.	too light of a load	injection timing is too early	overloading of the engine	too low of a compression ratio	
14	1080	B	The ability of the governor to prevent fluctuations in engine speed is termed _____.	sensitivity	stability	promptness	speed droop	

14	1081	B	In a simple mechanical governor, the _____.	centrifugal force rotates the ball-head	flyweight centrifugal force is balanced by spring force	flyweight centrifugal force is balanced by hydraulic pressure	speeder spring alone actuates the fuel control rod	
14	1082	C	To minimize the formation of carbon deposits on fuel injection nozzles, you should _____.	avoid using liquid-cooled nozzles whenever possible	avoid low cooling water temperatures	avoid prolonged overloading of the engine	make certain the gasket seal between the nozzle and cylinder head is tight	
14	1083	B	The metal-edge strainer, shown in the illustration, is used on medium-speed diesel engine reduction gear lube oil systems. Which of the following statements concerning this type of strainer?	As sludge and dirt accumulate on the outer surface of the strainer discs, the effectiveness of the strainer increases.	One turn of the T-handle is sufficient for cleaning the discs.	Particles of solid matter larger than the distances between the discs flow up through the inner space.	The strainer discs, spacers, and scraper blades are magnetic to prevent small metal particles from damaging the reduction gear.	See illustration number(s): MO-0057
14	1084	B	If the water level dropped rapidly in the expansion tank of a closed diesel engine cooling water system, you should suspect a _____.	loss of suction in the circulating pump	leak in the primary cooling system	broken raw water pump shaft	burned or cracked piston in one cylinder	
14	1085	A	Each receiver in a starting air system which can be isolated from a relief valve _____.	is to be provided with a suitable fusible plug to relieve the pressure in case of fire	will incorporate the use of an automatic unloading device	will not be approved for classification purposes	and satisfy U.S.C.G. regulations shall be approved	
14	1086	B	The intake air ducting to a diesel engine should not draw from an area on deck where flammable vapors released from tanks are present, because _____.	flammable vapors will accelerate corrosion of the turbocharger	the engine may overspeed and the normal governor or overspeed trip will not be able to secure the engine	the flammable vapors will result in an excessively rich mixture which will increase the brake horsepower output	all of the above	
14	1087	A	If the air supply to the "liquid sensor" of the device shown in the illustration is secured accidently, which of the following alarms will be indicated?	AO6: liquid indication.	AO7: transducer fault.	Low pressure in oil inlet.	Low pressure in oil outlet.	See illustration number(s): MO-0127
14	1088	C	How is oil supplied to the device shown in the illustration?	An attached positive displacement pump supplies oil to the separator.	The oil inlet paring disc creates a low pressure in the suction piping.	In this arrangement an independent pump is utilized.	This purifier as well as most others will be installed in the lower engine room to make use of gravitational forces.	See illustration number(s): MO-0127
14	1089	D	Which of the following statements describes the construction of the drive system shown in the illustration?	The main gear is located directly under the main input pinion shaft.	The lower reversing gear comes in direct contact with the main gear.	The upper reversing gear comes in direct contact with the main pinion.	The main bull gear is located to left of the main input pinion shaft.	See illustration number(s): MO-0085
14	1090	C	A gear type flexible coupling is precision built for _____.	reduced torsional vibration and resonance	increased slip and maneuvering capability	high torque transmittal under limited misalignment conditions	low axial thrust transmission under minimal alignment irregularities	
14	1091	B	A diesel engine piston ring face is in direct contact with the _____.	top of the ring groove	cylinder liner oil film	bottom of the ring groove	back of the ring groove	
14	1092	D	Injectors for use with heavy fuel oil must be cooled by either water or light oil to _____.	prevent heat corrosion to internal components	increase fuel delivery rate and economy	prevent preignition	avoid carbonization of the nozzle tips	
14	1093	B	The device labeled "A" shown in the illustration is termed a/an _____.	precombustion chamber	energy cell	turbulence or swirl chamber	air cell	See illustration number(s): MO-0068
14	1094	B	Which of the following conditions can cause oil to accumulate in the cooling system of a diesel engine?	Excessive valve train lubrication.	Defective oil cooler core.	Excessive lube oil pressure.	Overfilled lube oil system.	

14	1095	B	Which of the types of reduction gearing listed is best suited for medium speed main propulsion units?	Hypoid	Helical	Cyclical	Spur	
14	1096	D	When a nozzle tester is used to check the spray pattern of an injection nozzle, _____.	the valve should pop at 1/2 the actual set pressure	the nozzle should not make any noise when pressure is applied	the nozzle should operate within plus or minus 500 pounds of the specified opening pressure	the oil spray could cause blood poisoning if the spray penetrates the skin of the operator	
14	1097	B	Vessels having main engines arranged for air starting are to be provided with at least _____.	one automatic drain serving both containers	two air starting containers of approximately equal size	one control air container and one starting air container	one additional means of starting the main engine	
14	1098	A	Kingsbury thrust bearings are lubricated by _____.	flooding the thrust bearing assembly with oil	submerging oil wiper rings in an oil bath	pressure lubricating through internal passages	spraying oil directly on the thrust collar and shoes	
14	1099	C	Fuel is ignited in a diesel engine cylinder by _____.	a spark plug	injectors	the heat of compression	increasing jacket water temperatures	
14	1100	B	In a diesel engine, the time taken to heat the fuel particles, turn them into vapor, and bring about combustion is called _____.	injection lag	ignition delay	compression ignition	turbulence lag	
14	1101	C	The function of diesel engine piston compression rings is to _____.	prevent piston side thrust	prevent engine friction losses	transmit heat from the piston to the cylinder liner	remove oil from the cylinder combustion space	
14	1102	B	If the coolant temperature is too low as it passes through internally cooled fuel injectors, the injectors can be damaged by _____.	water condensation in the fuel	corrosion of the nozzle tip	carbon deposits on the nozzle tip	inadequate lubrication of the needle valve	
14	1103	B	A directly connected or geared main propulsion diesel engine should be fitted with a/an _____.	constant speed governor	variable speed governor	isochronous hunting governor	nutating disk governor	
14	1104	B	In order for the governor shown in the illustration to correct for the increase in load placed on the governed engine, the _____.	pilot valve initially moves up	pilot valve initially moves down	accumulator pressure is applied to the full exposed surface area of the power piston	actuating compensating piston rotates the terminal shaft in the increase fuel direction	See illustration number(s): MO-0092
14	1105	D	Which characteristic of the Otto cycle occurs in the actual diesel cycle but NOT in the theoretical diesel cycle?	No pressure increase during combustion.	Rapid pressure increase during combustion.	Rapid volume increase during combustion.	No volume increase during combustion.	
14	1106	D	The principal hazard to personnel when a diesel nozzle tester is in use is _____.	electrical shock	toxic fumes	explosion	blood poisoning	
14	1107	D	A possible cause for an individual piston to knock when at TDC on a slow-speed, two-stroke/cycle main propulsion diesel engine could be due to _____.	early fuel injection	excessive bearing play within the running gear	overloading of the cylinder	all of the above	
14	1108	D	Which of the bearing types listed is most commonly used in smaller vessel main propulsion reduction gears as thrust bearings?	Ball bearings	Poured bearings	Sleeved bearings	Tapered roller bearings	
14	1109	A	A diesel engine is operating with excessively high exhaust temperatures at all cylinders. To correct this condition, you should FIRST _____.	reduce the engine load	increase the cooling water flow	increase the lube oil pressure	adjust the fuel rack	
14	1110	A	Excessive diesel engine back pressure may be an indication of _____.	carbon buildup in the exhaust manifold	overcooling of the exhaust manifold	eroded muffler baffle plates	high injection pressure	
14	1111	C	The main reason for using bimetallic piston rings is to _____.	increase engine thermal efficiency	reduce specific fuel consumption	reduce the probability of ring fracture	allow for ring expansion	
14	1112	A	In order to start a large, low-speed, main propulsion diesel engine on high viscosity fuel after an extended shutdown, the _____.	fuel must be preheated	intake air should be preheated	lube oil outlet temperature should be increased 20, above normal	none of the above	

14	1113	D	A spring-loaded centrifugal flyweight governor responds to reduced engine load with an immediate increase in _____.	pilot valve oil pressure	speeder spring force	compensation needle valve clearance	centrifugal force on the flyweights	
14	1114	B	Lube oil accumulating in the cooling water system of a diesel engine will result in _____.	lube cooler failure	poor heat transfer	mechanical lubricator failure	camshaft seizure	
14	1115	D	The exhaust gas temperature prior to entering the turbocharger, of the system shown in the illustration, is 100°-150° (37.8°-65.5°C) higher than the individual cylinder temperatures. This indicates _____.	an exhaust valve leak	an exhaust manifold leak	the turbocharger is fouled	a normal condition	See illustration number(s): MO-0076
14	1116	B	A fuel leak occurs in the high pressure fuel piping between the injection pump and fuel nozzle. This requires immediate repair because of the _____.	high cost of fuel	serious fire hazard	possibility of pollution	poor combustion which will occur in that cylinder	
14	1117	D	The device used to limit engine torque at various engine speeds is called a _____.	speed limiting governor	variable speed governor	constant speed governor	load limiting governor	
14	1118	D	Which of the following precautions should be taken prior to starting the separator shown in the illustration?	Make sure the separator is properly assembled.	Check for the correct oil level in the gear housing.	Release the bowl brake and confirm proper valve line up.	All of the above are correct.	See illustration number(s): MO-0127
14	1119	B	Which of the speeder springs listed is more suitable for a governor installed on an engine operating over a wide speed range?	Spiral	Conical	Cylindrical	Helical	
14	1120	B	In a diesel engine, internal combustion causes the piston to be moved by _____.	the simple admission of fuel and air into the combustion space only	the pressure of gases developed	specially designed parts connected to a shaft	the concept of reciprocity	
14	1121	D	A secondary function of diesel engine piston rings is to _____.	reduce friction losses in the engine	absorb the piston side thrust	prevent cylinder liner wear	prevent excess lubricant from reaching the combustion space	
14	1122	A	When a nozzle tester is being used to test a "closed" type fuel injection nozzle, a clogged nozzle orifice will be indicated by a _____.	distorted spray pattern	chattering sound when the nozzle closes	squealing sound midway in the pump stroke	popping sound when the nozzle opens	
14	1123	D	Where engine bores exceed 230 mm, a bursting disc or flame arrester is to be fitted _____.	at the supply inlet to the control air manifold for non- reversing engines	on the exhaust manifold prior to the inlet of the turbochargers	on all devices subject to the by-products of combustion or lubrication system vapors	in way of the starting valve of each cylinder for direct reversing engines having a main starting manifold	
14	1124	D	Engine coolant accumulating in the diesel engine lubricating oil can result from a _____.	low oil pressure	high coolant pressure	leaking fuel injector	cracked cylinder head or liner	
14	1125	D	Once the separator shown in the illustration has been started, which of the following procedures should be followed?	Feel the machine for its tendency to vibrate.	Check the separator by listening for mechanical sounds.	Look for oil and water leaks in addition to other irregularities.	All of the above procedures should be followed.	See illustration number(s): MO-0127
14	1127	B	Persistent knocking of one cylinder of a diesel engine ceases when the fuel supply to that cylinder is secured. This problem may be a result of _____.	low loading of that cylinder	faulty combustion in that cylinder	sluggish piston ring action	excessive piston cooling	
14	1128	A	In a Kingsbury thrust bearing, the thrust shoes are _____.	pivoted, and the thrust collar turns with the shaft	turned by the shaft, and the thrust collar is stationary	lubricated by a ring oiler	hard chrome-faced to withstand wear	
14	1129	B	The purpose of the energy cell, or air cell, is to _____.	cause autoignition in the cell rather than in the main combustion chamber	create a high turbulence within the main combustion chamber	allow the spray to hit the piston rim rather than the cooler cylinder wall	make a blast in the main chamber prior to the piston expansion stroke	
14	1130	D	Which of the listed components will ensure equal continuous pressure on the thrust shoes of a Kingsbury thrust bearing?	Collar	Base ring	Thrust pins	Leveling plates	

14	1131	B	Barrel face, taper face, grooved, and chrome plated are all types of diesel engine _____.	pistons	piston rings	piston skirts	cylinder liners	
14	1132	D	You are testing a non-popping closed fuel injection nozzle using a nozzle tester. A pressure slightly less than design valve opening pressure is applied. If no fuel appears at the spray tip, the _____.	nozzle orifices are too small	nozzle orifices are eroded	needle valve is defective	needle valve is seating properly	
14	1133	C	Diesel engines are classified as reciprocating internal combustion engines because they _____.	use energy from fuel burned outside their cylinders	burn fuel in a combustion chamber that moves back and forth	burn fuel in a chamber where its energy moves a piston back and forth	use a continuous combustion process to impart rotary motion to the pistons	
14	1134	A	When more than one propulsion diesel engine is connected to a single propeller shaft through reduction gears, the gears are usually _____.	single reduction	double reduction	triple reduction	quadruple reduction	
14	1135	A	The initial reaction of the governor floating lever to a decrease in load, shown in the illustration, is best described by which of the following statements.	The floating lever moves up at the speeder rod end.	The floating lever moves down at the speeder rod end.	The floating lever remains stationary.	The floating lever shifts to the left.	See illustration number(s): MO-0092
14	1136	C	A main propulsion diesel engine is normally shut down by _____.	shutting off the air supply	overspeeding the engine	securing the fuel supply	securing the ignition system	
14	1137	B	Which of the following statements is correct concerning the operating function of the governor shown in the illustration?	The dial type adjusting knob (B) is used for setting speed droop and damping out hunting.	Excess oil under high pressure is released from the spring loaded accumulators to the sump.	The speed droop lever spring prevents the engine from racing or hunting by arresting the movement of the power piston after a speed change.	The compensating mechanism provides positive control to lower engine speed as load is increased.	See illustration number(s): MO-0096
14	1138	D	The efficient burning of fuel in a diesel engine is dependent upon the _____.	temperature of compression	atomization of the fuel	penetration of the fuel	all of the above	
14	1139	C	What type of reduction gear would most commonly be used with twin medium-speed propulsion diesel engines driving a single shaft?	Single reduction, planetary	Single reduction, single input	Single reduction, double input	Double reduction, double input, articulated	
14	1140	A	Which of the equal horsepower diesel engines listed, running at the same speed, is least affected by exhaust back pressure?	A four-stroke/cycle "V" type engine	A two-stroke/cycle "V" type engine	An in-line two-stroke/cycle engine	An opposed piston engine	
14	1141	D	Diesel engine piston ring gaps can be straight or angle cut. In comparison, the angle cut ring _____.	allows piston ring expansion	controls piston ring tension	increases ring wearing quality	decreases combustion gas leakage	
14	1142	A	The total air capacity for non-reversible main engines is to be sufficient for _____.	six consecutive starts	eight consecutive starts	ten consecutive starts	twelve consecutive starts	
14	1143	B	To properly clean the disks of a metal-edge type strainer in a diesel engine lube oil system, you should _____.	remove the disks and soak them in kerosene	rotate the T-handle spindle one turn	wire brush the disks to remove sludge	blow compressed air through the disks	
14	1144	D	Prior to starting the device shown in the illustration, the operator should _____.	renew the nylon bowl seal	tighten all foundation bolts	apply heat to the sludge tank	check gear housing oil level	See illustration number(s): MO-0127
14	1146	D	What is the best way of stopping an overspeeding diesel engine?	Disconnect the battery cables from the starting motor.	Drain the hydraulic fluid from the governor sump.	Block the flow of cooling air to the radiator.	Secure the fuel supply and block the air intake	
14	1147	D	The thermal energy produced by an internal combustion engine is transformed into _____.	combustion energy	internal energy	external energy	mechanical energy	
14	1148	C	One remedy for a high firing pressure, in addition to a high exhaust temperature in one cylinder of a diesel engine, is to _____.	increase scavenge air pressure	reduce fuel booster pump pressure	adjust the fuel rack	retard fuel injector timing	

14	1149	D	The most rapid period of fuel combustion in a diesel engine cylinder should begin just before the piston reaches top dead center and _____.	when fuel injection has been completed	when fuel vaporization has been completed	should efficiently continue through the after burning period in all properly designed engines	should be completed shortly after passing top dead center	
14	1150	A	The sealing surfaces of a diesel engine piston ring are considered to be the faces in contact with the cylinder wall, in addition to the ring groove _____.	bottom	back	top	side	
14	1151	A	The blower type crankcase ventilation system _____.	removes combustible gases from the crankcase	prevents the formation of combustible gases in the crankcase	cools lubricating oil	improves cold weather starting	
14	1152	D	One cylinder of a diesel engine is persistently knocking and does not cease when the fuel supply to that cylinder is secured. Which of the following problems may be the cause?	Low loading of the cylinder	Excessive cooling of that piston	Sluggish ring action on the piston	A mechanical defect in a working part	
14	1153	D	Routine monitoring of a diesel engine should include _____.	checking for leaks	checking temperatures and pressures	listening for abnormal noises	all of the above	
14	1154	A	If a diesel engine is difficult to start and operates with the engine temperatures lower than normal, you should suspect that the _____.	compression pressures are below normal	lube oil is diluted with fuel oil	cranking speed is too low	exhaust system is partially restricted	
14	1155	D	Which of the listed designs is effectively used to provide the turbulence necessary for proper combustion in a diesel engine cylinder?	Masked exhaust valves	Special piston rings	Turbocharger	Precombustion chamber	
14	1156	B	The overspeed trip installed on most diesel engines will stop the engine by shutting off the _____.	water supply	fuel oil supply	lube oil supply	exhaust damper	
14	1157	B	Which of the engine firing orders is listed for the diesel engine shown in the illustration?	1 3 5 2 6 4	1 5 3 6 2 4	1 4 2 3 6 5	1 3 5 2 4 6	See illustration number(s): MO-0038
14	1158	B	The pressure-volume diagrams illustrated are of four internal combustion engine cycles. Which one represents the ideal diesel cycle?	A	B	C	D	See illustration number(s): MO-0102
14	1159	B	Improper seating of an air starting check valve in an operating diesel engine is indicated by _____.	noise coming from the air starting valve	an overheated air supply pipe to the cylinder head	continuous operation of the starting air compressor	zero air pressure in the air starting system	
14	1160	D	White smoke exhausting from a diesel engine can result from _____.	high exhaust temperature	high lube oil temperature	low turbocharge speed	low cooling water temperature	
14	1161	C	The reason some two-stroke/cycle, diesel engine piston rings are pinned to prevent rotation, is _____.	cylinder lubricant is spread more evenly on the cylinder wall	less blow-by as the pin seals the end gap	to keep the ring ends from catching in the scavenging ports	to promote more even ring wear	
14	1162	D	A distorted spray pattern from a fuel injector can cause _____.	high firing pressure	corrosion of the nozzle tip	low fuel pressure	loss of power	
14	1163	A	Black smoke exhausting from an operating diesel engine can be caused by _____.	fuel dribbling from leaking fuel injectors	burning fuel with a high carbon content	burning fuel with a high vanadium content	burning fuel with a lower sulphur content	
14	1164	B	A six cylinder, single acting, four-stroke/cycle diesel engine has a bore of 10 1/2 inches(26.6 cm), and a stroke of one foot(30.5 cm), producing 75 HP (5.6 kw) per cylinder at 720 RPM. What is the mean effective pressure for the stated conditions?	39.7 psig (273.7 kPa)	79.4 psig (547.4 kPa)	476.4 psig (3284.6 kPa)	952.7 psig (6568.6 kPa)	
14	1165	C	In the pressure-volume diagram shown in the illustration, the atmospheric pressure line is indicated by line _____.	fa	agb	C	g	See illustration number(s): MO-0035
14	1166	B	A device which functions to bring a diesel engine to a full stop to protect it from damage is known as a/an _____.	torque limiter	overspeed trip	overspeed governor	load limit governor	

14	1167	B	If control air systems are supplied from starting air receivers, the capacity of the receivers should be sufficient _____.	to provide for intermittent starting procedures	for continued operation of these systems after capacity for the required number of consecutive starts has been used	to provide a nonreversible engine a minimum of twelve consecutive starts	to enable six consecutive starts of a reversible engine	
14	1168	A	Which of the following statements represents the advantage of a precombustion chamber used in an auxiliary diesel engine?	Timing of injection does not need to be exact.	Turbulence is eliminated.	Lower mean effective pressures are developed.	Excellent control of combustion can be attained.	
14	1169	D	When would the available energy of the exhaust gases of a two-stroke/cycle diesel engine be insufficient to drive an exhaust gas turbocharger, resulting in the incorrect amount of air for combustion?	During operation at low speed	During operation at rated speed, but low power output	During acceleration	All of the above	
14	1170	D	Which of the following statements would apply when adjusting the valve clearance of the unit shown in the illustration?	The valve is mechanically adjusted at point "D".	The valve is mechanically adjusted at point "E".	Tappet clearance is measured between points "A" and "B".	Cold valve clearance is measured between components "C" and "D".	See illustration number(s): MO-0074
14	1171	D	Oil control rings are designed with slotted holes to _____.	decrease ring contact area and cut down heat transfer	decrease contact pressure between ring and cylinder wall	increase contact pressure between ring and cylinder wall	permit excess oil to drain back to the sump	
14	1172	B	What is the average piston speed of a five cylinder low- speed engine with a bore of 29.5 inches (75 cm), a stroke of 63 inches (160 cm), and a rated speed of 123 RPM?	645 ft/min (196 m/min)	1291 ft/min (393 m/min)	2582 ft/min (787 m/min)	7749 ft/min (2362 m/min)	
14	1173	C	To routinely clean a metal-edge type lube oil strainer, you should _____.	remove the disc element and immerse it in gasoline	remove the disc element and immerse it in kerosene	rotate the disc element and drain off the sediment	rotate the knife-edge cleaner blades and drain off the sediment	
14	1174	B	Broken intake valve springs on one cylinder of a diesel engine can cause the engine to _____.	overspeed	fire improperly	lose oil pressure	overheat rapidly	
14	1175	D	One advantage obtained from the use of a precombustion chamber in a diesel engine is _____.	increased engine thermal efficiency	higher peak cylinder pressures	higher developed BMEP	smoother combustion	
14	1176	B	Electrically operated safety devices on auxiliary diesel engines function to stop the engine by _____.	increasing the volume of intake air	shutting off the fuel supply	increasing the engine back pressure	overspeeding the engine	
14	1178	B	The compression ratio of a diesel engine refers to the ratio between the _____.	piston area to connecting rod length	cylinder volumes at top dead center and at bottom dead center	engine cylinder size to piston size	the number of compression strokes for a given horsepower	
14	1179	D	A pilot-operated, main air starting valve begins leaking in one cylinder while the engine is operating. This malfunction is indicated by _____.	an increase in the exhaust temperature reading for that cylinder	an increase in the starting air manifold pressure	high exhaust pressure	an overheated air supply line to that cylinder	
14	1180	A	White smoke exhausting from an operating diesel engine may indicate _____.	a cracked liner	burning lube oil	an overloaded engine	insufficient combustion air	
14	1181	D	Which of the lettered items, shown in the illustration, identifies an oil control ring?	A	B	C	D	See illustration number(s): MO-0014
14	1182	A	When the opening pressure of a diesel fuel injector is greater than that specified by the engine manufacturer, the _____.	quantity of fuel injected is decreased	quantity of fuel injected will always be increased	start of injection is advanced	duration of injection will always be greater	
14	1183	C	The metal edge type filters used in diesel engine fuel oil and lube oil systems are normally cleaned in place by _____.	back flushing the system and draining the filter	opening the drain plug and blowing through the filter	manually operating a built-in scraper and draining the filter	flushing with any approved solvent then draining the system	

14	1184	D	The device represented by the symbol "B" in the illustration is used to _____.	remove all moisture from the system	lubricate the air supply	reduce the temperature of the air supply as a result of the heat of compression	remove most contaminants present in the air supply	See illustration number(s): MO-0115
14	1185	D	The device labeled "E", shown in the illustration, is properly identified as the _____.	stack compressor	thread alignment device	bowl hood	lower lock ring	See illustration number(s): MO-0112
14	1186	D	If the main engine of an unattended engine room shuts down automatically, it will be indicated by an alarm _____.	at each control station	in the chief engineer's quarters	in the captain's quarters	All of the above are correct.	
14	1187	A	Increasing the exhaust valve tappet clearance of a diesel engine will result in the exhaust valve opening _____.	later and closing earlier	later and closing later	earlier and closing earlier	earlier and closing later	
14	1188	B	White smoke issuing from the exhaust of an auxiliary diesel engine could mean _____.	the engine is overloaded	the engine is cold	there is too much lube oil in the cylinders	the turbocharger is fouled	
14	1189	A	In the diagram shown in the illustration, which segment of the cycle represents compression?	I	II	III	IV	See illustration number(s): MO-0037
14	1190	D	Precombustion chambers differ from turbulence chambers in that precombustion chambers _____.	allow fuel injection directly into the space above the piston	do not contain the fuel injector nozzle tip	contain the major portion of the total clearance volume	contain a smaller portion of the total clearance volume	
14	1191	D	Oil control rings function to _____.	allow proper lubrication of cylinders and compression rings	reduce the amount of lube oil burned in the combustion chamber	scrape excess lube oil from the liner on the downstroke	all of the above	
14	1192	C	What may be used to protect starting air mains against explosions arising from improperly functioning starting valves?	The starting air main shall be protected by the use of a rupture disc.	No protection is necessary because all starting air valves are designed similar to check valves.	An isolation non-return valve is to be installed at the starting air supply connection to each engine.	The materials used in the construction of the starting air mains will contain any explosion.	
14	1193	B	Before starting the device shown in the illustration, the operator should always check the _____.	bowl spindle nut	braking mechanism	pump drive coupling	auto restart switches	See illustration number(s): MO-0127
14	1194	A	Which of the following statements identifies the purpose of the valve bridge shown in the illustration?	Operate two exhaust valves from one rocker arm.	Lubricate the exhaust valves through internal lube oil passages.	Ensure positive closing action of the exhaust valves.	Provide positive rotation of the exhaust valves.	See illustration number(s): MO-0019
14	1195	D	In diesel engines, the four basic events (intake, compression, power and exhaust) are performed once in _____.	two crankshaft revolutions in a two-stroke/cycle engine	two power strokes in a two-stroke/cycle engine	one power stroke in a two-stroke/cycle engine	two piston strokes in a two-stroke/cycle engine	
14	1196	D	Engine protection by means of an alarm or shutdown control can be obtained with devices that are sensitive to _____.	temperature	pressure	engine speed	all of the above	
14	1197	A	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?	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.	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.	To increase the critical speed range of the engine, reduce the setpoint of 17A and 17B respectively, to .80 bar and 1.0 bar.	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.	See illustration number(s): MO-0114
14	1198	B	From the engine data shown in the illustration, what would be the average piston speed if the engine were turning 400 RPM?	1300 ft/min	1400 ft/min	1450 ft/min	1500 ft/min	See illustration number(s): MO-0004

14	1199	A	If a diesel engine fails to start, one of the likely causes is _____.	low compression temperature	low ambient air pressure	high lube oil pump pressure	high fuel oil booster pump pressure	
14	1200	B	Maximum horsepower of a diesel engine is attained _____.	when the engine RPM is pulled down by overload	at rated engine RPM	at 95% of rated engine RPM	at 95% of a properly adjusted governor RPM with the engine under full load	
14	1201	B	The main purpose of the piston oil scraper rings is to _____.	seal the space between the piston and the liner	reduce the amount of lube oil burned in the combustion chamber	transmit heat from the piston to the cylinder liner	damp out fluctuations of the piston side thrust	
14	1202	A	What is commonly used to create turbulence in a diesel engine combustion system?	Shape of the piston crowns.	Increasing the compression ratios.	Increasing the effective plunger stroke.	Increasing the turbocharger gear ratio.	
14	1203	C	A "Blotter test" is performed on the lube oil of a diesel engine to determine the _____.	percent of fuel dilution of lube oil	flash point	relative detergency remaining	TBN number	
14	1204	B	What causes diesel fuel to be ignited in the cylinder of an operating diesel engine?	Spark plug	Heat of compression	Carburetor	Glow plug	
14	1205	B	If a hydraulic starting motor turns, but the diesel engine does not, the most likely cause is _____.	excessive viscosity in the hydraulic fluid	a malfunctioning overrunning clutch	loss of accumulator precharge	air in the hydraulic system	
14	1206	A	White smoke exhausting from a diesel engine can be caused by _____.	low combustion temperature	a leaking fuel nozzle check valve	late fuel injection	plugged oil-scraper ring holes	
14	1207	C	The highest pressure in a diesel engine cylinder normally occurs _____.	at TDC	before TDC	after TDC	during air starting	
14	1208	D	How many power strokes per crankshaft revolution are there in an eight cylinder, two-stroke/cycle diesel engine?	One	Two	Four	Eight	
14	1209	C	A smoking exhaust from an operating diesel engine could be caused by _____.	low sulfur content in the fuel	a loose injector inlet connection	late fuel injection	high injection pressure	
14	1210	A	The purpose of compressing the air within the cylinder of a diesel engine is to _____.	produce the heat for ignition	decrease injection lag	increase ignition delay	aid in exhausting burnt gases	
14	1211	C	The primary purpose of oil control rings on a diesel engine piston is to _____.	provide a reservoir for cylinder lubrication	pump oil into the combustion space for cylinder cooling	prevent excessive lubricating oil consumption	allow hydraulic oil film formation on the cylinder	
14	1212	A	Which of the fuel nozzles listed requires the LEAST maintenance?	Pintle	Single hole	Multi-hole	Open	
14	1213	A	Diesel engine lube oil diluted with fuel oil is indicated by _____.	decreased viscosity	decreased pour point	increased flash point	increased viscosity	
14	1214	A	At the point in time indicated by the information shown in the illustration, the #3 piston is on the _____.	intake stroke	exhaust stroke	compression stroke	power stroke	See illustration number(s): MO-0038
14	1215	B	The indicator card shown in the illustration is produced with a/an _____.	oscillating drum	rotating chronomatic drum	balanced-diaphragm indicator	sliding camshaft	See illustration number(s): MO-0108
14	1216	C	To shut down a diesel engine after it exceeds the set maximum speed, which type of device listed should be used?	Speed limiting governor	Overspeed governor	Overspeed trip	Overspeed relay	
14	1217	A	Opposed piston diesel engines are classified as _____.	two-stroke/cycle single acting	two-stroke/cycle double acting	four-stroke/cycle single acting	four-stroke/cycle double acting	
14	1218	B	The most important factor in engine performance is the actual power output at the end of the crankshaft available for doing work. This is known as _____.	indicated horsepower	brake horsepower	net horsepower	friction horsepower	
14	1219	D	In describing basic diesel engine operation, the term "event" refers to _____.	the production of high pressure gases	the removal of expended combustion gases	the admission of air to the cylinder	All of the above	

14	1220	C	The valve gear shown in the illustration is for a four-stroke/cycle, medium speed, diesel engine, with fuel injection commencing in at 10° BTDC. Approximately how many crankshaft degrees from the point at which fuel injection begins, does the exhaust valve push rod begin to move up?	90°	90°-120°	130°-160°	180°-190°	See illustration number(s): MO-0013
14	1221	C	Oil control rings used in two-stroke/cycle diesel engines are located near the bottom of the piston skirt in order to _____.	increase the liner area covered by the oil film	maintain an oil film on the lower liner where scuffing is prevalent	keep excess oil away from intake and exhaust ports	help cushion piston skirt side thrust by providing a hydrodynamic oil wedge	
14	1222	B	The spray holes in diesel engine fuel valves should be cleaned using carbon solvent and _____.	diesel fuel	a special cleaning wire	a copper wire brush	a shaved wooden dowel	
14	1223	D	When excessive fuel dilution is noted in the lube oil, the oil should be _____.	centrifuged	filtered	strained	changed	
14	1224	C	The diesel engine shown in the illustration is a _____.	four-stroke/cycle engine at the end of the compression stroke	two-stroke/cycle engine at the end of the compression stroke	four-stroke/cycle engine at the end of the exhaust stroke	two-stroke/cycle engine at the beginning of the power stroke	See illustration number(s): MO-0007
14	1225	D	Figure "D" shown in the illustration is a/an _____.	scavenging port	air start valve	multi-stage fuel injector	precombustion chamber	See illustration number(s): MO-0068
14	1226	B	An overspeed trip serves to _____.	stop the engine by cutting off the cooling water supply	stop the engine by closing the air intake	slow the engine but not stop it	slow the engine to half of normal load	
14	1227	D	In an operating diesel engine, which of the following conditions is an indication of a leaking air starting valve?	Noise coming from that air starting valve.	Continuous operation of the starting air compressor.	Zero air pressure in the air starting system.	Overheated starting air pipe to the cylinder head.	
14	1228	B	Bluish smoke in the exhaust of an operating diesel engine can be caused by _____.	an overheated engine	a scored cylinder liner	water leaking into a cylinder	low combustion temperature	
14	1229	B	Which of the listed cylinder liner surface conditions indicates proper lubrication?	Dull black appearance.	Bright appearance.	Thin layer of lacquer.	Thick oily film.	
14	1230	C	Pyrometer thermocouples should be inspected and cleaned of carbon deposits _____.	monthly	quarterly	every 6 months	yearly	
14	1231	B	To function properly, oil control rings used on a diesel engine piston must distribute sufficient oil to all parts of the cylinder wall and must also _____.	prevent any lubricant from reaching the compression rings	prevent excessive lubrication from reaching the combustion space	provide metal-to-metal contact to seal the cylinder against blow-by	assure a positive means of scraping carbon accumulation from the cylinder	
14	1232	D	The dripping of fuel from an injector nozzle after injection terminates, often results in _____.	early combustion	incomplete combustion and decreased fuel consumption	decreased cylinder wall temperatures and increased exhaust gas temperatures	coking and blocking of the fuel nozzles	
14	1233	D	When fuel oil has seriously contaminated a diesel engine lubricating oil, you should _____.	filter to remove the fuel oil	use the settler to remove the fuel oil	remove the fuel oil by centrifuging	drain and then renew the lube oil supply	
14	1234	A	A diesel engine may fail to start due to _____.	low air charge temperature	high cranking speed	excessive fuel dilution of lube oil	high compression pressure	
14	1235	B	A diesel engine electric starting motor is operated under a no-load condition. Continuing to operate the motor unloaded will _____.	disengage the throw out bearing	overspeed and cause serious damage	fail to develop normal speed	cause the pinion to fail	
14	1236	C	An overspeed trip stops a diesel engine when the engine _____.	runs out of fuel	has low lubricating oil pressure	exceeds a set maximum speed	has high cooling water temperature	

14	1237	A	Where engine bores exceed 230 mm, a bursting disc or flame arrestor is fitted _____.	at the supply inlet to the starting air manifold for non-reversing engines	on the exhaust manifold prior to the inlet of the turbocharger	on all devices subject to the by-products of combustion or lubrication system vapors	in way of the control valve of each cylinder for direct reversing engines having a main starting manifold	
14	1238	B	All alarms occurring on the control unit of the device shown in the illustration will _____.	not be indicated in numerical order	shut off the oil feed to the separator	cause the separator to automatically enter the sludge discharge cycle	be initiated by the water transducer or vibration switch	See illustration number(s): MO-0127
14	1239	D	What is the average piston speed of an engine with a 12 inch stroke, operating at 900 RPM?	450 ft/min	900 ft/min	1500 ft/min	1800 ft/min	
14	1240	A	When the cold tappet clearance is less than that specified by the engine manufacturer, the diesel engine valves will _____.	open earlier than normal	close earlier than normal	remain open for a shorter duration	fail to open when the valves are warm	
14	1241	D	In order to keep excess oil from the intake ports in two-stroke/cycle diesel engines, _____.	wide compression rings are used	oil rings are located above the piston pin	dense chromium plating is used on all piston rings	oil rings are located near the bottom of the piston skirt	
14	1242	B	If it becomes necessary to clean the spray holes in a diesel engine fuel injector, you should use a suitable size piano wire and _____.	gasoline	carbon solvent	degreasing compound	strong detergent	
14	1243	C	A decrease in the flash point of diesel engine lube oil indicates the lube oil has become _____.	contaminated with sludge	contaminated with carbon	diluted with fuel oil	diluted with water	
14	1244	B	The ratio of the brake horsepower to the indicated horsepower of a diesel engine is its _____.	thermal efficiency	mechanical efficiency	brake thermal efficiency	volumetric efficiency	
14	1245	B	Turbulence is created in the cylinders of a diesel engine to _____.	obtain injection lag	help mix fuel and air	increase combustion pressure	utilize higher injection pressures	
14	1246	C	The device shown in the illustration is used to secure the air supply to a diesel engine when the engine overspeeds. In order for this to occur, supplied oil pressure must _____.	move the piston rod to the left	move the piston rod to the right	decrease allowing the spring to move the piston rod to the right	decrease allowing the butterfly valve to turn counterclockwise	See illustration number(s): MO-0103
14	1247	C	The main operating characteristic of diesel engines which distinguishes them from other internal combustion engines is the _____.	method of supplying air	cooling system	method of igniting fuel	valve operating mechanism	
14	1248	A	The firing order of an in-line, four-stroke/cycle, six cylinder, auxiliary diesel engine is 1-5-3-6-2-4. When the #1 cylinder is firing at top dead center, the #3 piston is _____.	on the intake stroke	on top dead center	on the power stroke	at bottom dead center	
14	1249	C	A diesel engine is warmed up and white vapor is noted in the exhaust, this could indicate _____.	excessive cylinder lubrication	a lugging engine	a leaking cylinder liner	overloading of one cylinder	
14	1250	B	How are the pressure and temperature affected in a diesel engine cylinder during compression?	Pressure and temperature decrease	Pressure and temperature increase	Pressure decreases and temperature increases	Pressure increases and temperature decreases	
14	1251	C	Slots are provided in a diesel engine piston oil scraper ring to _____.	decrease piston side thrust pressure	allow for thermal expansion of the ring within the ring land	permit drainage of excess oil to the engine sump	make it more flexible for scraping cylinder surfaces	
14	1252	C	A broken pintle in a fuel injector usually causes _____.	corrosion of the spray nozzle	clogging of the orifices	distortion of the spray pattern	erosion of the valves	
14	1253	A	If a used lube oil analysis indicates excessive fuel dilution, the lube oil should be _____.	changed	centrifuged	filtered	settled	
14	1254	D	The RPM of "A" is 100 and hobbed with 96 teeth. If gears "B", "C", and "D" have 80, 30, and 46 teeth respectively, the RPM of "D" in the gear train illustration is _____.	78.26 RPM	463.77 RPM	65.22 RPM	556.52 RPM	See illustration number(s): MO-0088

14	1255	C	Diesel engine operating conditions are indicated by the color of the exhaust smoke. Blue smoke can indicate _____.	low compression pressure and high exhaust temperature	an overloaded engine	clogged drain holes in the oil control rings	complete combustion	
14	1256	C	A diesel engine is provided with an overspeed throw-out weight shown in the illustration, and is tripping out at too low an RPM. In order to correct this problem, you should _____.	replace piece #10	decrease compression on spring #12	increase compression on spring #12	increase tension on lockwire by adjusting pieces #31, #32 and #35	See illustration number(s): MO-0101
14	1257	B	The system shown in the illustration utilizes a water transducer which is _____.	similar to those used in sonar systems	located in the oil outlet piping	essential in monitoring the amount a water entering the separator	a mechanical/electrical device with a variable dc output	See illustration number(s): MO-0127
14	1258	B	Oil accumulating in the exhaust piping or manifold of a diesel engine can be caused by _____.	collapsed hydraulic valve lifters	worn valve guides	excessive crankcase vacuum	excessive lube oil pressure	
14	1259	D	If the compression ratio is increased on any diesel engine, _____.	the expansion ratio will decrease	combustion will be slowed down	thermal efficiency will decrease	thermal efficiency will increase	
14	1260	A	In diesel engines, the four basic events (intake, compression, power, and exhaust) are performed once in _____.	one complete crankshaft revolution in a two-stroke/cycle engine	two crankshaft revolutions in a two-stroke/cycle engine	two power strokes in a two-stroke/cycle engine	two piston strokes in a four-stroke/cycle engine	
14	1261	B	The upper edges of the piston rings, shown in the illustration are rounded off to _____.	obtain increased strength	reduce oil pumping	keep the ring from sticking in the grove	reduce the probability of ring fracture	See illustration number(s): MO-0015
14	1262	C	A practical way of checking for excessive fuel injection in one cylinder of an operating diesel engine is to _____.	feel the high pressure fuel line	check the cylinder exhausts for white smoke	frequently check the cylinder exhaust temperature	isolate each cylinder and inspect the injector	
14	1263	A	A "detergent-type" lube oil, used in a diesel engine, should be replaced when _____.	fuel oil dilution is 5%	it begins to turn black	the exhaust shows traces of blue smoke	all of the above	
14	1264	A	On the indicator card shown in the illustration, point "B" indicates _____.	top dead center	bottom dead center	the beginning of injection	the end of ignition	See illustration number(s): MO-0108
14	1265	D	Diesel engine exhaust valve springs are under compression when they are _____.	wide open only	partially open only	closed only	in any position	
14	1266	D	The butterfly valve overspeed device, shown in the illustration, is actuated by the engine overspeeding, and _____.	an increase in the oil pressure acting against the piston rod	the counterclockwise rotation of the butterfly valve to shut off the air to the engine	the increase in compression on the spring	the piston rod being forced to move to the right	See illustration number(s): MO-0103
14	1267	C	A diesel engine with high lugging capacity, would be necessary for driving a _____.	controllable pitch propeller	generator set	winch	centrifugal pump	
14	1268	B	Which of the factors listed has the greatest effect on the mechanical efficiency of a diesel engine?	Temperature of the intake air	Friction within the engine	Mechanical condition of the supercharger	Mechanical condition of the turbocharger	
14	1269	B	What determines the number of events occurring in a cycle of operation in an internal combustion engine?	Crankshaft revolution	Type of engine (diesel or gasoline)	Distance a piston travels during a stroke	Number of pistons	
14	1270	B	A diesel engine may fail to start when being cranked, due to _____.	high cetane number	insufficient compression	low lube oil viscosity	high lube oil pressure	
14	1271	D	The function of the piston compression rings used in a diesel engine is to _____.	seal the space between the piston and liner	transmit heat from the piston to the cylinder liner	reduce the amount of combustion gas blow-by	all of the above	
14	1272	D	Which of the following problems could cause misalignment between the needle valve and nozzle in a fuel injection nozzle?	A bent fuel needle.	A defective nozzle tip seat.	A distorted valve body.	All of the above.	
14	1273	B	Which of the following test points should be considered a determining factor as to whether or not a diesel generator's lube oil should be drained and renewed?	An extremely low neutralization number.	An extremely high precipitation number.	The oil appears black in color.	A minor increase in flash point.	

14	1274	A	Which of the following statements represents the working principle of the water transducer used with the separator shown in the illustration?	The value of the capacitor varies with the dielectric constant of the liquid flowing through it.	As the water content in the oil decreases, so does the dielectric constant and consequently its capacitance.	The capacitor completes part of the oscillator circuit which causes changes in capacitance.	All of the above are correct.	See illustration number(s): MO-0127
14	1275	C	If a diesel engine hydraulic starting motor fails to disengage from the engine, your FIRST check should be the _____.	throw-out bearing	hydraulic pump	overrunning clutch	accumulator	
14	1276	B	An overspeed safety shutoff for a diesel engine is shown in the illustration. Which of the following movements will occur if the engine overspeeds?	Piece #8 will move up	Piece #8 will move down	Piece #10 will rotate counterclockwise	Piece #9 will move to the left	See illustration number(s): MO-0104
14	1277	A	Which of the following statements describes the operating characteristics of a precombustion chamber?	When fuel oil is injected into the precombustion chamber, it does not need to be as finely atomized as the fuel oil in diesel engines having direct injection.	When operating correctly, combustion should not occur in the precombustion chamber.	Engines which are designed with precombustion chambers are more likely to suffer blocked nozzle holes, due to fuel oil impurities, than engines designed with direct injection.	Engines with precombustion chambers, which do not have an increased compression ratio, are not as difficult to start when cold, as engines with direct injection.	
14	1278	A	On a diesel engine, using a distributer type air starting system, that is not running, which of the following methods may be used to detect leaking air starting valves?	Open the cylinder test cocks and check for blowing air.	Check the position of the air start valve cams.	Stop the air compressor and check for pressure drop throughout the system.	Feel each air supply line to see which is warm from leaking air.	
14	1279	A	Modern marine diesel engines using mechanical fuel injection, operate on a combustion cycle which is _____.	a combination of constant volume and constant pressure	a combination of constant temperature and constant pressure	entirely constant pressure	entirely constant volume	
14	1280	C	Which of the listed devices could be used as a substitute for a ring grooving tool used to remove hard carbon deposits from piston ring grooves in preparation for installing new rings?	Steel brush	Fine emery cloth or steel wool	A section of the removed compression ring	A case hardened scraper	
14	1281	C	The main function of piston compression rings is to _____.	prevent excessive cylinder liner wear	reduce friction losses in the engine	seal the space between the piston and the liner	limit upward flow of lube oil into the combustion space	
14	1282	A	Visual inspection of a fuel injector valve, removed during overhaul, shows heat discoloration of the lower end of the valve. This is indicative of _____.	valve leakage	insufficient valve lift	choking of nozzle holes	return check valve leakage	
14	1283	C	How often should the lubricating oil of a diesel engine be changed?	After every trip	Every 4000 hours	According to manufacturer's instructions	Every time they are shutdown	
14	1284	B	The flywheel reduces speed fluctuations by _____.	maintaining a constant rack setting	storing kinetic energy	maintaining equal exhaust pressure	maintaining even camshaft speed	
14	1285	B	One of the factors limiting the amount of load which can be put on a modern marine diesel engine is the _____.	governor sensitivity	exhaust temperature	fuel injection pressure	speed of the cam shaft	
14	1286	C	The overspeed trip device installed in some diesel engines is automatically actuated by _____.	spring force	hydraulic pressure	centrifugal force	mechanical linkage	
14	1287	C	Modern marine diesel engines equipped with mechanical fuel injection operate on a combustion phase within the cycle which is _____.	entirely constant pressure	entirely constant temperature	a combination of constant volume and constant pressure	a combination of constant temperature and constant pressure	

14	1288	D	Turbulence in the cylinder of a two-stroke/cycle main propulsion diesel engine is mainly created by _____.	directional intake valve ports	masked intake valves	precombustion chambers	intake port design	
14	1289	A	In a single acting, two-stroke/cycle, diesel generator engine, the power impulse in an individual cylinder occurs _____.	once every crankshaft revolution	once every two crankshaft revolutions	once every piston stroke	twice every piston stroke	
14	1290	D	An indicator card or pressure-volume diagram, shows graphically the _____.	compression ratio of the engine	volume of the engine	relationships between pressure and volume during one stroke of the engine	relationships between pressure and volume during one cycle of the engine	
14	1291	C	Piston compression rings used in a diesel engine function to _____.	transfer heat from the cylinder to the piston	scrape oil from the sides of the piston	seal the combustion space from the crankcase	prevent any piston contact with the cylinder liner	
14	1293	D	To lubricate the illustrated starting motor bearings _____.	add ATF to the housing to a level just above the bottom of component #31	add oil to the housing to the centerline of component #29	install inline compressed air lubricators in the supply line	do nothing as the bearings are sealed	See illustration number(s): MO-0044
14	1294	B	Which of the following statements represents the working principle of the water transducer used with the separator shown in the illustration?	The value of the capacitor varies with the dielectric consistency of the liquid flowing through it.	As the water content in the oil increases, so does the dielectric constant and consequently its capacitance.	The capacitor completes part of the oscillator circuit which causes changes in capacitance.	All of the above are correct.	See illustration number(s): MO-0127
14	1295	C	White smoke exhausting from a diesel engine can be caused by a _____.	high combustion temperature	high compression pressure	cracked cylinder liner	fuel with a high vanadium content	
14	1296	A	A diesel engine is equipped with the overspeed trip assembly shown in the illustration. At the inspection, the counter weight was found to be tripping out at too high of an RPM. The adjustment to lower the tripping speed RPM was carried out by _____.	decreasing the compression on spring #12	increasing the compression on spring #12	changing piece #10 to a lighter weight	reducing the counterweight pivot point friction	See illustration number(s): MO-0101
14	1297	C	The theoretical minimum compression ratio necessary to ensure compression ignition in a direct injection diesel engine is _____.	8:01	10:02	12:01	14:01	
14	1298	B	A diesel engine is operating under a normal load with low firing pressures and high exhaust temperatures. The most probable cause of this condition is _____.	a missing air intake filter	a restricted exhaust manifold	the fuel rack being too far in	the fuel rack being too far out	
14	1299	A	A multi-orifice fuel injection nozzle is usually used with which of the listed types of combustion chamber?	Open combustion chamber	Precombustion chamber	Turbulence chamber	Energy cell	
14	1300	B	A diesel engine which is rated for normal operation at a crankshaft speed of 800 RPM, is commonly classed as a _____.	slow-speed diesel	medium-speed diesel	high-speed diesel	constant-speed diesel	
14	1301	B	Which of the following statements represents the function of the compression rings installed at the top of a diesel engine piston?	Control the amount of lube oil burned in the combustion chamber.	Transmit heat from the piston to the cylinder liner.	Prevent damage to ring groove inserts by acting as a heat dam.	Dissipate combustion chamber gas pressure by channeling it through the ring gap.	
14	1302	B	Because of the close tolerances used in diesel engine fuel oil pumps, a worn plunger requires _____.	grinding the spare plunger to the barrel	replacing the plunger and the barrel	highly polishing both the plunger and barrel	replacing plunger only	
14	1303	A	If the oil control rings were installed upside down on a diesel engine piston, which of the following conditions would result?	Excessive oil pumping would occur.	The rings would tend to overheat.	The ring grooves would be blocked.	Tendency for ring breakage is increased.	
14	1304	C	A diesel engine emits blue exhaust smoke as a result of _____.	cold intake air	excessive compression pressure	excessive cylinder lubrication	a light load	

14	1305	D	If a diesel engine is smoking excessively under load, the cause could be _____.	low exhaust back pressure	early fuel injection in one of the cylinders	compression pressure in one of the cylinders	plugged injector holes	
14	1306	D	For most diesel propulsion and generator engines, the overspeed trip device will stop the engine by _____.	moving the governor control to stop	shutting off the lubricating oil supply	tripping the governor emergency stop lever	shutting off the fuel supply	
14	1307	D	A diesel engine exhaust valve spring is under compression when _____.	the valve is open	the piston is at top dead center	the valve is closed	all of the above	
14	1308	D	If the diesel engine starter-drive mechanism fails to disengage after the engine starts, which of the following situations will occur?	The engine will stall.	The starter motor will have reverse current.	The engine flywheel will be burred.	The starter motor will overspeed.	
14	1309	B	The highest loads applied to the diesel engine crankshaft main bearings are _____.	axial loads	firing loads	inertia loads	centripetal loads	
14	1310	A	During which of the listed piston strokes of a four-stroke/cycle diesel engine, is the piston moving downward?	Intake stroke	Compression stroke	Exhaust stroke	Pumping stroke	
14	1311	B	Combustion gases formed in the cylinder of a diesel engine are prevented from blowing past the piston by _____.	cylinder valves	compression rings	piston skirts	oil rings	
14	1312	B	While overhauling a jerk-type fuel pump it is necessary to replace the pump plunger. Which of the parts listed below must also be replaced?	Delivery check valve	Pump barrel	Tubing to the injector	Cam follower	
14	1314	A	The purpose of the flywheel is to _____.	provide energy to operate the engine between power impulses	neutralize the primary inertia force of the crankshaft	reduce the shock of starting loads on the main bearings	prevent the engine from operating at critical speed	
14	1315	C	Which of the following statements is accurate concerning the vibration sensing device used with the separator shown in the illustration?	Vibration sensors are not used with centrifuges currently installed on diesel vessels due to excessive vibrations developed by the main propulsion units.	The vibration switch is sensitive to vibration in a direction horizontal to its mounting base and is normally installed low on the separator where movement is magnified.	The detector mechanism consists of an armature suspended on a flexure pivot and restrained from motion by a permanent magnet acting through a small air gap.	The detector is so arranged to prevent abnormal harmonic frequencies from being developed while the separator is passing through its critical speed range.	See illustration number(s): MO-0127
14	1316	D	An emergency diesel generator should automatically shut down in the event of _____.	dangerous overspeeding	a loss of lube oil pressure	the activation of the fixed CO2 system for the emergency generator space	all of the above	
14	1317	A	Increasing the compression ratio of a diesel engine while maintaining the designed rate of fuel flow will result in _____.	increased horsepower	reduced efficiency	increased heat loss	lower cylinder pressures	
14	1318	C	Black smoke exhausting from an operating diesel engine is an indication of poor combustion which may be caused by _____.	water in the fuel	insufficient fuel for combustion	clogged air intake passages	burning lubricating oil	
14	1319	A	Which of the following statements is correct concerning available astern power for diesel main propulsion systems?	Astern power is to be provided in a sufficient amount to secure proper control of the ship in all normal circumstances.	The astern power of the main propelling machinery is to provide for continuous operation astern at 60% of the ahead rpm at rated speed.	For main propulsion systems without reversing gears, controllable pitch propellers or electric propulsion drive, running astern is not to lead to overload conditions.	Astern power available will be equal to ahead power when controllable pitch propellers are utilized, thus discounting the need for increased operating parameters.	

14	1320	D	What is the function of the device labeled "1" shown in the illustration?	It provides a low pressure point for the addition of chemicals into the boiler feed system.	It relieves the excessive pressure developed in the jacket water cooler.	It aids in the removal of combustible gases formed in the jacket water.	It provides a low pressure point for adding chemicals into the jacket water system.	See illustration number(s): MO-0111
14	1321	A	In a modern internal combustion diesel engine, the load carrying part of the engine is referred to as the _____.	bedplate or base	sump or oil pan	cylinder block	frame	
14	1322	D	If the plunger or barrel of a fuel injection jerk pump becomes damaged, _____.	only the replacement of the entire pump would be acceptable	the injection pump and injection nozzle must be replaced	either the barrel or plunger must be replaced	the barrel and plunger must be replaced as a unit	
14	1323	D	A well-lubricated bearing surface always appears _____.	well knurled	slightly streaked	lightly glazed	highly polished	
14	1324	A	Waste heat boilers may be equipped with vents on the feed water heater heads to _____.	prevent air binding	release excess pressure	allow for feedwater treatment	remove sediment	
14	1325	D	Provision is to be made for ventilation of an enclosed diesel engine crankcase by means of a small _____.	aperture not exceeding 1" in diameter	fan to develop a slight suction not exceeding 1" of water	vent line attached to the upper most area of the crankcase near the center of the engine	breather or by means of a slight suction not exceeding 1" of water	
14	1326	C	According to U. S. Coast Guard Regulations (46 CFR), internal combustion engine driven emergency generators shall be operated under load for at least two hours at least once _____.	a week	every two weeks	a month	a quarter	
14	1327	B	Which of the following statements describes the results of excessive microbiological growths within a fuel system?	All excessive amounts of growth will cause the main engines of the vessel to stall due to the inability to supply the proper quantities of fuel to satisfy the existing load.	The deposits produced by these growths form blockages and flow restrictions ultimately leading to improper atomization of the fuel into the cylinders.	Eventually the growth of these organisms will deplete the supply of food available to them, which in turn will cause their demise.	If continual growth is permitted, a sweet odor similar to that associated with baking will be noticed when system components are opened for inspection.	
14	1328	D	The device labeled "B", shown in the illustration, is known as the _____.	upper ring chamber	set of regulating rings	comminuting device	centripetal pump chamber cover	See illustration number(s): MO-0112
14	1329	C	Which device is used to prevent over pressurization of the illustrated distiller?	"13"	"19"	"26"	"27"	See illustration number(s): MO-0111
14	1330	A	The heat exchanger plates, used in the device shown in the illustration, are produced from which of the listed materials?	Titanium	Anodized aluminum	Phosphor bronze	Stainless steel	See illustration number(s): MO-0110
14	1331	C	When installing the bearing cap on the device shown in the illustration, which of the precautions listed must be observed?	If the device is covered with abrasive material or contaminates, the unit may be reassembled, provided an abnormal method of reassembly is followed.	After applying antisieze to the external threads, torque one side at a time to the appropriate values using a quality torque wrench.	Once the bearing cap is properly torqued, measure the critical dimensions to ascertain even tightening of the cap.	Prior to installing the cap, position the thrust shoes in their proper locations.	See illustration number(s): MO-0121
14	1332	D	If the demister used in the device shown in the illustration is improperly installed, which of the following will occur?	The vacuum of the device will increase.	The temperature of the device will decrease.	Interstage leakage will cause a decrease in output.	There will be an increase of chlorides measured at the distillate pump salinity cell.	See illustration number(s): MO-0110

14	1333	D	If the detergent type lubricating oil being used in a diesel engine is black, the oil _____.	must be centrifuged	must be filtered	must be changed	is holding finely dispersed carbon in suspension	
14	1334	C	If valve "H" shown in the illustration is opened wide while the distiller is in operation, _____.	the absolute pressure of the unit will increase with an associated decrease in shell temperature.	the absolute pressure of the unit will increase due to the increased affect of the air ejector.	the absolute pressure of the unit will increase with an associated increase in shell temperature.	the absolute pressure of the unit will not be affected, but the rate of condensation will be decreased.	See illustration number(s): MO-0111
14	1335	D	Which of the following statements represents the two major functions provided by the item labeled "20" shown in the illustration?	The pump supplies the motive force to the ejectors and removes the excess distillate.	The pump is used to drain the shell when the unit is secured, in addition to powering the ejectors.	The pump provides for venting of associated equipment while also powering the ejectors.	The pump supplies the motive fluid to the ejectors in addition to suppling the feed water to the distiller.	See illustration number(s): MO-0111
14	1336	B	Coast Guard Regulations (46 CFR) require emergency diesel generator sets, with forced lubrication systems, to be provided with a _____.	low lube oil level alarm system	low lube oil pressure alarm system	low lube oil level cutoff system	high cooling water temperature cutout system	
14	1337	C	The symbol shown in the illustration as "E" is called a _____.	two position switch	dual directional valve	double check valve	restrictor valve	See illustration number(s): MO-0115
14	1338	C	From the graph shown in the illustration, if the separating temperature required is to be 167°F, and the specific gravity of the oil is .98 kg/dm3 at 59°F, what size regulating ring is required?	86 mm	89 mm	92 mm	95 mm	See illustration number(s): MO-0113
14	1339	D	What is used as the primary operating medium during the sludge discharge cycle, shown in the illustration?	Light phase liquid	Heavy phase liquid	Hydraulic fluid	Water	See illustration number(s): MO-0112
14	1340	B	The device labeled "H", shown in the illustration is referred to as the _____.	centripetation chamber bottom gasket	centrifugation chamber bottom gasket	square-cut, lower major seal	square-cut, lower minor seal	See illustration number(s): MO-0112
14	1341	A	The side clearance of the compression rings on diesel engine pistons is necessary to _____.	permit gas pressure behind and on top of the rings	prevent carbon accumulation behind the rings	allow for lube oil drainage behind the rings	prevent combustion gases burning the ring grooves	
14	1342	A	What is the function of device "C" shown in the illustration?	It removes impurities entrained in the vapors produced in section "G".	It allows for access into section "F".	It controls the amount of vapor produced in section "F".	The division plate creates a pressure drop between the two stages.	See illustration number(s): MO-0110
14	1343	C	Which of the following conditions is indicated when the lubricating oil of a diesel engine turns dark after a few hours of use?	The oil should be purified.	The lubricating quality of the oil has dangerously deteriorated.	The oil is functioning normally.	Normal engine operating temperatures have been exceeded.	
14	1344	C	The device labeled "A", shown in the illustration, is known as the _____.	centripetal pump cover	bowl assembly hood	regulating ring	kinetic converter	See illustration number(s): MO-0112
14	1345	D	Under normal operating conditions, the level maintained in device "N" shown in the illustration is _____.	in the upper third of the glass	in the middle third of the glass	in the lower third of the glass	not apparent, because the water level is kept below the range of the glass	See illustration number(s): MO-0110
14	1346	C	A propulsion diesel engine, having a maximum continuous output of over 300 HP, and driving a controllable pitch propeller, must be fitted with a separate overspeed device, in addition to the normal governor. This second device is to prevent the engine from exceeding the rated speed by more than _____.	5%	10-15%	20%	25-30%	
14	1347	A	What is the function of item "D" shown in the illustration?	It heats the entering feedwater.	It heats the jacket water entering the device.	It causes the jacket water to evaporate.	It condenses the distillate.	See illustration number(s): MO-0110

14	1348	D	If the separating temperature is to remain constant, what is the relationship between the specific gravity of the oil and the required size of the regulating ring?	For a constant operating temperature, the greater the specific gravity of the oil the larger the regulating ring.	The specific gravity of the oil and the size of the regulating ring are related only during the initial design stages of the centrifuge.	With oils of greater specific viscosities it is proper to select smaller regulating rings regardless of the operating temperatures desired.	The larger sized regulating rings are designed to be used with oils of lower specific gravities.	See illustration number(s): MO-0113
14	1349	C	The device labeled "P" shown in the illustration is properly called the _____.	disc stack base	lower main disc	distributor	first major insert	See illustration number(s): MO-0112
14	1350	D	Which of the following conditions occurs in the section labeled "F" of the device shown in the illustration?	Non-condensable vapors are removed and water vapors are preheated.	The sea water flowing through device "I" is cooled.	The jacket water flowing through device "I" is heated.	The vapors produced in section "G" are condensed and the non-condensable gases are removed.	See illustration number(s): MO-0110
14	1351	D	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?	Use of bimetallic piston rings	Ring gap pretensioning	Thermal increase in ring-end clearance	Gas pressure acting against the back of the ring	
14	1352	D	When disassembling or assembling an injection pump plunger and barrel you should _____.	keep the parts immersed in diesel fuel	always keep the plunger and barrel together	work over a linoleum-type surface	all of the above	
14	1353	D	Oil oxidation, as a result of excessively high lube oil temperature, is harmful to a diesel engine because _____.	oil foaming will occur	large quantities of oil are consumed	lube oil viscosity is always decreased	corrosive by-products are usually formed	
14	1354	A	Line "K" shown in the illustration is the _____.	distillate pump suction	brine eductor suction	brine eductor inlet	feed water inlet	See illustration number(s): MO-0110
14	1355	A	Prior to starting, the volume of liquid retained in space "J" of the device shown in the illustration is _____.	minimal while the sliding piston is in the sludge discharge position	equal to the displacement volume of the sliding position	always greater than the volume of liquid present when the unit is operating	minimal while the sliding piston is in the closed position	See illustration number(s): MO-0112
14	1356	C	According to Coast Guard Regulations (46 CFR), how often shall internal combustion engine driven emergency generators be operated under load?	Once a week for two hours	Once a week for four hours	Once a month for two hours	Every six months for four hours	
14	1357	B	What occurs in the space labeled "G" of the device shown in the illustration?	Jacket water is admitted into the boiling chamber.	The feed water enters the device and vaporizes while exposed to a vacuum.	The feed water is heated prior to being pumped into section "F".	Scale accumulates at position "E".	See illustration number(s): MO-0110
14	1358	C	Using the graph shown in the illustration, the oil being separated has a specific gravity of .87 kg/dm3 at 72.5,C. What will be the specific gravity if the temperature is lowered to 40,C?	0.872 kg/dm3	0.882 kg/dm3	0.892 kg/dm3	0.902 kg/dm3	See illustration number(s): MO-0113
14	1359	B	Which of the valve arrangements listed would be correct for operating the distillation plant shown in the illustration?	Valves "H", "J", "K", "L", "M" open, valve "D" closed.	Valves "J", "K", "L", "M" open, valves "D" and "H" closed.	Valves "D", "H", "J", "K", "L", "M" open, valves "I", "G", "F", and "E" closed.	Valves "C", "J", "K", "L", "M" open, valves "A", "B", "D", and "H" closed.	See illustration number(s): MO-0111
14	1360	C	Item "M" shown in the illustration is the _____.	salt water inlet	feed water inlet	jacket water inlet	brine water outlet	See illustration number(s): MO-0110
14	1361	D	In an operating diesel engine, the sealing of the cylinder is the result of the compression rings being forced against the cylinder walls by _____.	oil pressure acting behind the ring	compression pressure acting beneath the ring	ring expansion from the heat of combustion	combustion gas pressure acting behind the ring	
14	1362	B	Surface irregularities, such as erosion and pitting on injection pump plungers, will _____.	increase ignition delay	affect fuel oil metering	affect engine performance at low speed only	disappear due to fuel oil abrasion	
14	1363	D	The oxidation by-products forming in diesel engine lube oil can cause _____.	pitting	sludge	hard varnish	All of the above	

14	1364	C	In a large slow-speed propulsion diesel engine, the force applied to the crosshead is _____.	against the crosshead during power stroke and away from the crosshead during the compression stroke	against the crosshead during the compression stroke and away from the crosshead during the power stroke	against the crosshead during the power and compression strokes	away from the crosshead during the power and compression strokes	
14	1365	D	If a particular liquid has a specific gravity of .96kg/dm3 at 77,F, what will be the specific gravity of the liquid, as determined from the graph shown in the illustration, if the temperature is increased to 167,F?	.910 kg/dm3	.915 kg/dm3	.920 kg/dm3	.925 kg/dm3	See illustration number(s): MO-0113
14	1366	B	Coast Guard Regulations (46 CFR) require a horizontal dry exhaust pipe from a diesel engine must _____.	be equipped with a water cooled muffler	be arranged to prevent entry of boarding seas	have adequate insulation in any berthing space	not penetrate the engine room casing	
14	1367	A	The line shown in the illustration, identified by the letter "S", is the _____.	distillate pump discharge	brine pump discharge	condensate pump discharge	ejector supply pump discharge	See illustration number(s): MO-0110
14	1368	A	The primary function of line "J" shown in the illustration is to _____.	remove air and non-condensable gases from the unit	allow for removal of produced distillate	prevent backflow of eductor discharge	remove condensable gases from the unit	See illustration number(s): MO-0110
14	1369	C	The discharge nozzle shown in the illustration, is indicated by the letter _____.	A	K	S	X	See illustration number(s): MO-0112
14	1370	C	For the operation of the illustrated device what fluid flow would be expected at the connection labeled "I"?	The feed water enters the device.	The sea water exits the device.	The sea water used for condensing enters the device.	Main engine jacket water is admitted to the unit.	See illustration number(s): MO-0110
14	1371	A	Which of the following statements is true concerning the piston rings shown in the illustration?	Three compression and one oil scraper ring are pictured.	The top and bottom rings pictured are bimetal rings.	The top compression ring is protected from overheating by a ring dam.	Top compression ring has an inside bevel.	See illustration number(s): MO-0013
14	1372	A	Uneven bolt tightening during the installation of a fuel injection pump can result in _____.	binding of pump moving parts	ignition delay	high torsional shock to fuel lines	improper pump-to-engine timing	
14	1373	A	Which of the following operational conditions will occur to the diesel engine lube oil at extremely high temperatures?	The oil oxidizes and forms carbon deposits.	The viscosity increases.	Engine oil consumption decreases.	Lubricating qualities of the oil are enhanced.	
14	1374	C	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/dm3 at 68°F, and the separating temperature is 158°F.	86 mm	104 mm	110 mm	117 mm	See illustration number(s): MO-0113
14	1375	C	The function of device "O" shown in the illustration is to _____.	regulate the amount of brine entering the unit	control the amount of brine exiting the evaporator	control the amount of feed water entering the evaporator	provide a positive suction head for the brine pump	See illustration number(s): MO-0110
14	1376	C	Coast Guard Regulations (46 CFR) require a horizontal dry exhaust pipe from a diesel engine to _____.	be equipped with a water-cooled muffler	have adequate insulation in any berthing space	terminate above the deepest load waterline	not penetrate the engine room casing	
14	1377	B	Which of the following represents the motivating power fluid used in conjunction with the ejectors?	The ejectors do not require a motive power.	The motive power is the feed water supply.	The motive power is the brine pump output, prior to being discharged overboard.	The motive power is the jacket water flowing through the ejectors.	See illustration number(s): MO-0110
14	1378	D	An improperly assembled centrifuge, of the type shown in the illustration, may result in which of the following operating conditions to occur?	Excessive wear of fuel injection equipment.	Increased main bearing wear.	Severe injury to engine room personnel.	All of the above.	See illustration number(s): MO-0112
14	1379	B	Which of the operating positions, for valve "A" shown in the illustration, should be chosen to maintain the circuit in continuous flow, regardless of failure to the included down stream components?	1	2	3	4	See illustration number(s): MO-0115

14	1380	B	Which of the following is NOT a function of the water supply through item "P" shown in the illustration?	It supplies feed water to evaporator.	It supplies the operating medium used in the removal of the distillate.	It supplies the operating medium used in the removal of the brine.	It supplies the operating medium used in the removal of air and non-condensable gases.	See illustration number(s): MO-0110
14	1381	C	The purpose of piston ring end clearance is to _____.	allow the combustion gases to press the ring down on the land	allow the combustion gases to get behind the ring and press it against the cylinder liner	prevent buckling and breaking of the ring	aid in protecting the oil film	
14	1382	D	If lost motion is present in an individual fuel injection pump, which of the following problems will occur?	Fuel injection will be increased.	Fuel injection will remain unchanged.	Fuel injection will occur earlier.	Fuel injection will occur later.	
14	1383	B	Which of the listed conditions can cause a diesel engine to use too much lube oil?	Dirty lube oil filter	Too much piston ring wear	High lube oil viscosity	Low lube oil temperature	
14	1384	D	The symbol with the output "ee" shown in the illustration, is properly called a blocking valve. Which of the following statements describes its function when incorporated into a slow speed diesel engine pneumatic control circuit?	The device is used to interrupt the control signal to port "J" of the air start distributor shown in illustration MO-0053.	The blocking device prevents direct hydraulic flow from operating the reversing mechanism.	All speed signals emanating from the throttle lever are diminished by half due to the blocking effect of this valve.	The device is used to interrupt the pneumatic signal to port "A" of the distributor shown in illustration MO-0053.	See illustration number(s): MO-0116
14	1385	D	The flange identified by the letter "T" shown in the illustration is _____.	attached to the outlet of the brine ejector	directly connected to the feed water supply line	directly connected to the jacket water supply line	attached to the outlet of the air ejector	See illustration number(s): MO-0110
14	1386	A	A diesel engine is driving an alternator required to run at 1800 RPM. The overspeed governor is normally required to be set within a range of _____.	1980 to 2070 RPM	2100 to 2200 RPM	2200 to 2300 RPM	2300 to 2400 RPM	
14	1387	C	Failure to establish sufficient vacuum when starting up the unit shown in the illustration may be the result of _____.	improper operation of the brine pump	improper operation of the distillate pump	neglecting to close the vent shell	neglecting to latch the dump valve	See illustration number(s): MO-0110
14	1388	C	Excess brine accumulated in the distiller, shown in the illustration, is removed during normal operation by _____.	the hydrokineter labeled "21"	opening the drain valve located to the left of orifice "19"	the continuous action of ejector "22"	orifice "19" regulating the amount of feed water entering the distiller, thereby preventing excess brine accumulation	See illustration number(s): MO-0111
14	1389	D	Which of the components listed may be used to satisfy Coast Guard regulations for the unit shown in the illustration?	Shaft bull gear	Worm and worm gear	Pneumatic three position valve	Limit switches	See illustration number(s): MO-0116
14	1390	A	Which of the listed fluids exits the flange labeled "Q" shown in the illustration?	Sea water from the condenser plate assembly.	Sea water from the evaporator tube bundle.	Jacket water from the condenser plate assembly.	Sea water from the evaporator plate assembly.	See illustration number(s): MO-0110
14	1391	C	The upper piston compression ring can be protected from overheating by a heat dam. This physical concept is shown in the illustration and designated by the figure lettered as _____.	A	B	C	D	See illustration number(s): MO-0017
14	1392	D	If the discharge valve of the fuel injection pump, shown in the illustration, leaks during operation, which of the following conditions should be expected?	Injection timing will be increased.	Fuel will leak into the return line.	Effective length of stroke will be increased.	Effective length of stroke will be decreased.	See illustration number(s): MO-0065
14	1393	B	Excessive lube oil consumption in a diesel engine can be caused by _____.	late combustion	plugged oil wiper rings	low lube oil temperature	low lube oil pressure	
14	1394	D	The circuit shown in the illustration represents a/an _____.	pneumatic actuated, multiple position, control unit	hydraulic actuated, muli-position control unit	infinitely positioned pneumatic control	detented, control air pressure, reducing and filtering unit	See illustration number(s): MO-0115

14	1395	D	Which of the listed fluids enters the device at flange "R" shown in the illustration?	Jacket water	Sea water from the service system	Evaporator feed water	This is not an inlet; jacket water exits from this flange.	See illustration number(s): MO-0110
14	1396	C	What is the correct term for the orifice indicated by the letter "K" in the device shown in the illustration?	Inlet orifice	Inlet annular	Inlet nozzle	Discharge port	See illustration number(s): MO-0112
14	1397	C	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 these events?	The lock ring insures proper contact between the bowl top and the sliding bowl bottom, in addition to compressing the disc stack.	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.	When tightened, the lock ring allows for movement of the sliding piston and positions the sliding piston within the bowl bottom.	The lock ring insures proper positioning of the disc stack and maintains a positive contact of the bowl top and bowl bottom.	See illustration number(s): MO-0112
14	1398	A	In an actual installation, the flange identified by the letter "U", shown in the illustration, can be directly connected from the brine ejector discharge to the _____.	overboard discharge line	upper flash chamber labeled "F"	feed water return labeled "K"	second effect tube bundle	See illustration number(s): MO-0110
14	1399	D	Which of the following statements describes the function of the device labeled "C" shown in the illustration?	The regulator reduces the pressure of the supply air to provide ancillary main engine services.	The device is a relief valve with feedback to prevent excessive pressure from damaging system components.	Constant pressure is maintained at device "B" while device "C" is used only to modify the output signal.	The regulator, or pressure reducer, drops the supply pressure to the desired operating level.	See illustration number(s): MO-0115
14	1400	B	Item "F" shown in the illustration is called a _____.	flow limiting device	relief valve	pressure reducer	sequencing valve	See illustration number(s): MO-0115
14	1401	A	In diesel engines, hydraulic valve lifters are used to _____.	reduce valve gear pounding	increase valve operating lash	obtain greater valve lift	create longer valve duration	
14	1402	D	If the discharge valve of the fuel injection pump, shown in the illustration, allows fuel to leak out of the high pressure fuel line, _____.	injection timing will be advanced	air bubbles will form in the fuel return line	effective length of stroke will be increased	effective length of stroke will be decreased	See illustration number(s): MO-0065
14	1403	B	Which of the following problems can cause excessive consumption of the lubricating oil in a diesel engine?	Dirty lube oil filters	Excessive piston ring wear	Excessively high lube oil viscosity	Excessively low lube oil temperatures	
14	1404	D	What is the function of the device labeled "3" shown in the illustration?	The heat exchanger serves to heat the jacket water during cold water operation.	The jacket water cooler is used to raise the temperature of the sea water flowing through it.	The device specifically serves to remove the latent heat of vaporization from the jacket water.	The cooler removes sensible heat from the jacket water.	See illustration number(s): MO-0111
14	1405	C	When tightening the plate type heat exchanger shown in the illustration, care must be taken to _____.	prevent damage to the aluminum plates	avoid fracturing the backing plate	use a specific pattern while measuring the distance to which the plates have been compressed	avoid using a torque wrench that has not been recently calibrated	See illustration number(s): MO-0110
14	1406	B	Auxiliary diesel engines can be automatically shut down as a result of _____.	low lube oil temperature	low lube oil pressure	high exhaust temperature	high cooling water pressure	
14	1407	D	What would happen if valve "25", shown in the illustration, vibrated open with the unit in operation?	The unit would continue to operate with no adverse effects.	Jacket water would be automatically by-passed around the distiller.	The unit would automatically shut down due to the closing of the low pressure contacts.	The absolute pressure of the unit would increase, causing a decrease in output quantity and purity.	See illustration number(s): MO-0111
14	1408	D	If valve "D" is opened during the normal operation of the distiller shown in the illustration, which of the events listed will occur?	The amount of vapor formed in the evaporator will increase.	The jacket water cooler will be overloaded, eventually causing a critical engine alarm.	The output of pump "7" will increase with a corresponding increase in pressure.	The amount of vapor being formed in the evaporator will decrease.	See illustration number(s): MO-0111

14	1409	C	Excluding line losses, how many distinct pressure drops will occur as sea water flows through the heat exchangers in the cooling system shown in the illustration?	3	4	5	6	See illustration number(s): MO-0111
14	1410	B	Which of the tools listed must be used when retightening the heat exchanger used in the device shown in the illustration?	Torque wrench	Steel ruler or tape measure	Cantilever wrench	Pneumatic impact wrench	See illustration number(s): MO-0110
14	1411	A	Valve lash, or clearance refers to the _____.	clearance between the top of the valve stem and the rocker arm	compression of the valve springs	clearance between the valve seat inserts and the head	out of roundness of the fuel injection cams	
14	1412	D	The area indicated by the letter "L" of the device shown in the illustration is properly called the _____.	pre-injection chamber	operating water reservoir	channelling chamber	injection chamber	See illustration number(s): MO-0112
14	1413	A	The operation of the lube oil cooler, shown in the illustration as item #4, will be characterized by which of the following statements?	The temperature of the sea water entering the cooler will be higher when operating with the distiller.	The temperature of the lube oil entering the cooler will increase above normal setpoint of the temperature controller.	The pressure of the sea water to the lube oil cooler will be increased above the operating pressure of the system without the distiller on line.	The pressure of the lube oil at the cooler will be increased above normally accepted limits.	See illustration number(s): MO-0111
14	1414	C	If item "F" begins leaking during operation, which of the following operating conditions will not occur?	The oil/water interface will move outward from the vertical axis of the machine.	The water seal will be lost.	The oil/water interface will remain in the same neutral position.	The unit will not properly operate and should automatically shut down.	See illustration number(s): MO-0112
14	1415	B	What occurs within the tubes of the device labeled "23" shown in the illustration?	The heat from the jacket water passing within the tubes is being transferred to the feed water on the outside of the tubes.	The feed water flowing through the inside of the tubes is being heated by the jacket water on the outside of the tubes.	The heat being transferred is subliminal, therefore expansion is taking place within the tubes.	The heat of combustion from the engine is being transferred asiotropically, adding latent heat to the entering feed water.	See illustration number(s): MO-0111
14	1416	D	Which of the following conditions can cause excessive sea water leakage into the illustrated device?	Improper venting during start-up.	Improper venting during operation.	Failure to properly tighten the bolts of the evaporator heat exchanger.	Failure to properly tighten the bolts of the condenser heat exchanger.	See illustration number(s): MO-0110
14	1417	D	After removing the bowl hood of the device shown in the illustration, excessive quantities of sludge are visible. Which of the following statements represents the approach to rectify the situation?	Disassemble the entire unit, clean all components, replace all defective discs and use the proper lubricant where required.	Steam clean the components in place, check for proper alignment, using the match marks provided, reassemble and restart the unit.	Remove only the disc stack, separate all the discs, clean with steel wool and solvent, replace the disc stack ensuring it is located by use of the dowel pin shown.	Disassemble the entire unit, clean all components, replace any defective gaskets and use the proper lubricants where required.	See illustration number(s): MO-0112
14	1418	C	Where is the latent heat obtained to create vapor from the feedwater in the illustrated distiller?	Only as it passes through device "20".	During its contact period with heat exchanger "3".	From having passed through "23".	While it is in contact with device "24".	See illustration number(s): MO-0111
14	1419	D	The device shown in the illustration is utilized in some diesel control systems. If the output of "2" is directed to the engine governor, what will be its primary function?	The output is for speed jumps and is utilized to ensure the transmission of stepped speed reductions.	The output of this device is used to secure the engine if it becomes overloaded.	The output shown is used to prevent torpid speed changes resulting from fluctuations of the input signal.	The pneumatic arrangement serves to prevent the engine from operating within a critical speed range.	See illustration number(s): MO-0114

14	1420	D	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?	The bowl will fail to close, but the unit will be capable of shooting while in operation.	Operating water will be supplied through port "S".	The unit will not start due to pressure/time delay relays.	The bowl will fail to close when starting and the unit will not shoot when operating.	See illustration number(s): MO-0112
14	1421	A	In some modern large diesel engines, which of the following is used as the support for the main bearings?	Bedplate	Block	Base	Sump	
14	1422	D	After a recent overhaul of the device shown in the illustration, the unit floods and the shell pressure is the same as the jacket water supplied to the unit. This is caused by _____.	an improperly adjusted feed water regulator	a faulty interplate condenser gaskets	improper tightening of the condenser	improper tightening of the evaporator	See illustration number(s): MO-0110
14	1423	B	Excessive piston ring wear in a diesel engine will cause _____.	high lube oil viscosity	increased lube oil consumption	low lube oil temperatures	high firing pressures	
14	1424	C	If the aftercoolers shown in the illustration, labeled as "5" and "6", become fouled on the sea water side, how will the sea water flow to the distiller condenser be affected?	The flow to the condenser will be reduced while the output of the distiller will be increased.	The flow to the condenser will not be affected due to the operation of the pressure control valve "H".	Both the flow to the condenser and the distiller output will be reduced.	The sea water pump "H" will always supply sufficient quantities of water.	See illustration number(s): MO-0111
14	1425	B	Which of the following statements describes "N" shown in the illustration?	the included angle of oil flow	the centrifuge disc stack	the sole direction of heavy phase flow	the relative size of the separation zone	See illustration number(s): MO-0112
14	1426	D	Which of the listed conditions represents the greatest problem if item #8 in the illustration fails while underway at sea?	Fresh water will not be distilled due to insufficient heating.	The standby pump #7 will automatically be placed into operation for emergency cooling.	Cooling water will be supplied by pump #20 through valve "M".	The main engine will overheat unless slowed or secured until an alternate means of cooling water flow can be provided.	See illustration number(s): MO-0111
14	1427	B	If valve "O" of the unit shown in the illustration is closed during normal operation, which of the following statements describes the consequences?	The unit will flood, vacuum will decrease, shell temperature will remain the same, and the relief valve "27" will lift.	The unit will flood, vacuum will decrease, the shell temperature will modulate, depending upon the sea temperature and the relief valve "26" will lift.	The unit will flood, vacuum will decrease and the equalizing holes located in the tube sheet of "24" will prevent over pressurization.	Transducer "18" will sense excess pressure causing an automatic shut down of pump "20".	See illustration number(s): MO-0111
14	1428	C	Where does the shoot cycle operating liquid first come in contact with the rotating forces of the device shown in the illustration?	While traveling under disc stack "N".	At the inlet cone labeled "O".	In the opening chamber labeled "L".	At the inlet orifice labeled "S".	See illustration number(s): MO-0112
14	1430	D	Which of the following statements describes the primary reason for the device shown in the illustration to be incorporated into the air start system?	The shuttle valve compensates for any decrease in the operator's physical abilities.	The three position valve prevents the fuel flow reaching the fuel injection pumps.	This unit controls the air operated turning motor exhaust when the unit is in operation.	The unit shown is used to prevent starting of the main engine when the turning gear is engaged.	See illustration number(s): MO-0116
14	1431	B	Which of the following statements is true concerning the valve bridge and hydraulic lash adjuster assembly shown in the illustration?	The exhaust valves are directly closed by the action of the bridge spring.	The lash adjuster maintains zero lash between the end of the valve stem and the valve plunger.	The ball check is always open when the exhaust valve is seated.	The bridge spring applies the required force to maintain contact between the plunger and the exhaust valve.	See illustration number(s): MO-0019

14	1432	D	Item "10" shown in the illustration is used to _____.	prevent damage to device "9" by reducing turbulence	cancel the effects of improper regulation developed by device "11"	regulate flow from the drain pump	direct the flow from the distillate pump	See illustration number(s): MO-0111
14	1433	C	Sticking of diesel engine piston compression rings may be caused by _____.	high compression pressure	excessive ring action	excessive cylinder lubrication	improper ring rotation	
14	1434	A	The device labeled "C" shown in the illustration is known as the _____.	upper locking ring	lower paring device	upper paring gasket	pump lock	See illustration number(s): MO-0112
14	1435	D	During operation which device listed removes air and non-condensable gases from the unit shown in the illustration?	"22"	"27"	"25"	"21"	See illustration number(s): MO-0111
14	1436	B	The unit shown in the illustration is beginning the sludge discharge cycle. The operating liquid solenoid valve has been energized and space "J" is filling up. Which of the following actions should occur next?	The liquid enters the opening space, controlled by the discharge port "S", thereby causing the sliding bowl bottom to move upwards.	The liquid enters the opening space with the net resultant force causing the piston slide to move down.	The liquid enters via port "X", travels through the closing chamber, and exits port "S", maintaining an upward force against the bowl bottom,	The liquid remains trapped in space "J", developing an upward force to open the bowl.	See illustration number(s): MO-0112
14	1437	D	The gasket "U" shown in the illustration, is used to seal and ensure the movement of the _____.	sliding bowl bottom	bowl bottom	operating slide	sliding piston	See illustration number(s): MO-0112
14	1438	D	The area indicated by the letter "J" of the device shown in the illustration is properly known as the _____.	operating chamber	paring chamber	closing chamber	sealing chamber	See illustration number(s): MO-0112
14	1439	B	During the normal operation of the centrifuge bowl shown in the illustration, the operating liquid solenoid and bypass valves should be in which position?	The solenoid valve is closed and the bypass valve is open.	The solenoid valve is closed and the bypass valve is closed.	The solenoid valve is open and the bypass valve is closed.	The solenoid valve is open and the bypass valve is open.	See illustration number(s): MO-0112
14	1440	B	Regulator"17B" shown in the illustration, is set for a constant output of 1.2 bar and the input signal to "1" is currently 0.42 bar. If the output from "17A" can not exceed 0.85 bar, then the current output from "2" should be _____.	0.35 bar	0.42 bar	0.85 bar	2.05 bar	See illustration number(s): MO-0114
14	1441	A	What is the purpose of a hydraulic valve lash adjuster?	Allows for constant contact between the valve stem and the rocker arm regardless of whether the engine is cold or warm.	Insures proper pressure in a hydraulic system.	Eliminates need to remove valve springs.	Provides far easier removal of the valve cage.	
14	1442	A	If a diesel engine runs roughly, which of the systems listed is most likely to be at fault?	Fuel	Lubricating	Cooling	Ignition	
14	1443	C	Worn diesel engine intake valve guides can result in _____.	increased engine breathing efficiency	excessive valve lash	excessive lube oil consumption	lower than normal fuel consumption	
14	1444	D	Which of the following statements describes what will occur to the volume of water vapor as it is exposed to the lower temperatures existing in the device labeled "24" shown in the illustration?	The volume is increased as condensation occurs at the tube surfaces.	The latent heat of condensation is removed causing the volume to increase.	The volume will increase if the valve labeled "J" is opened excessively, resulting in an increase of the distiller absolute pressure.	The volume is greatly reduced, contributing to condensation within the condenser.	See illustration number(s): MO-0111
14	1445	C	Item "O" of the device shown in the illustration is the _____.	fair flow nut	inlet directional guide	spindle nut	impeller locking device	See illustration number(s): MO-0112

14	1446	C	Item "A" the illustration is a/an _____.	indent operated, four position, four-way valve	lever operated, infinite position, four-way valve	manually operated, detented, four position, four-way valve	pneumatically operated, infinite position, reducing valve	See illustration number(s): MO-0115
14	1447	D	Which set of valves will be opened intentionally to remove heat from the main engine jacket cooling water system shown in the illustration?	"B" and "D", "L" and "M"	"J" and "K", "G" and "H"	"G" and "H", "E" and "F"	"A" and "C", "L" and "M"	See illustration number(s): MO-0111
14	1448	D	The wear liner shown in the illustration is indicated by the letter _____.	"G"	"N"	"P"	"R"	See illustration number(s): MO-0112
14	1449	D	The area indicated by the letter "W", shown in the illustration is correctly termed the _____.	closing chamber	parting chamber	upper sliding piston chamber	opening chamber	See illustration number(s): MO-0112
14	1450	D	What is the function of the item "7" shown in the illustration?	The jacket water pump circulates water only through the jacket water cooling system to provide engine cooling.	The jacket water pump supplies the distiller with sea water feed while also powering the ejectors.	The jacket water pump will have no affect on the operation of the distiller.	The jacket water pump circulates water throughout the engine cooling and distiller heating systems.	See illustration number(s): MO-0111
14	1451	C	Diesel engine valve springs function to _____.	hold the valves open	keep the valves off their seats until the exhaust stroke is completed	close the valves	open inlet valves when the air injection cycle begins	
14	1452	A	In the common rail system, excessive pressure in the header may be caused by _____.	improper adjustment of the bypass valve	a dribble in the fuel injection nozzle	insufficient leakoff through injection nozzle packing	a malfunctioning injection nozzle	
14	1453	D	Which of the following conditions can cause excessive lube oil consumption in a diesel engine?	Low lube oil temperature	Dirty lube oil strainer	Low lube oil pressure	High lube oil temperature	
14	1454	C	The items labeled "21" and "22", shown in the illustration are used to remove _____.	distillate and non-condensable gases	non-condensable gases from two separate sections of the distiller	brine and non-condensable gases	brine and jacket water from the condenser	See illustration number(s): MO-0111
14	1455	D	The port "X" shown in the illustration allows water to enter the adjoining chamber. During what cycle of operation will this occur?	Operating backflush cycle	Bowl retention cycle	Clarification cycle	Sludge discharge cycle	See illustration number(s): MO-0112
14	1456	D	Which of the conditions listed would indicate a large condenser tube leak within the distiller shown in the illustration?	A decrease in the level of the main engine expansion tank as indicated by a low level alarm.	An increase in distiller output resulting from the combination of jacket water and the distillate produced.	A slow continuous rise in the lube oil cooler outlet temperature indicated at device "4".	The activation of the salinity monitoring equipment's annunciator circuit.	See illustration number(s): MO-0111
14	1457	D	The graphic line between items "27", "12", "9", and "20", shown in the illustration, is used to indicate the use of _____.	ambient venting devices	thermal venting devices	single wire controls	electrical conduits and circuitry	See illustration number(s): MO-0111
14	1458	B	The device labeled "D", as shown in the illustration, is the bowl _____.	hood	top	cover	hub	See illustration number(s): MO-0112
14	1459	D	Which of the following statements describes the operation of the circuit shown in the illustration?	The output of "2" will always be less than the input at "1" by 0.35 bar (35 kPa), to prevent engine damage due to operation in the critical speed range.	A gradual rise of the input signal to "1" will cause a multiple stepped output from "2" proportional to the input signal.	The output signal from "2" will be equal to the setpoint of "17A" only when the input is less than the setpoint of "17B", permitting the transition signal to become modulated.	The output from "2" is equal to the input to "1" until the input to "1" exceeds the setpoint of "17B", causing "22A" to shift and permits an output signal equal to the input.	See illustration number(s): MO-0114

14	1460	B	Which of the following statements describes the approximate relation between the feed water entering the unit shown in the illustration and brine being removed?	The brine will be removed at a faster rate than feed water entering to prevent the possibility of flooding.	Seventy-five percent of the feed water entering the unit is removed as brine.	Twenty-five percent of the feed water entering the device is removed as brine.	The amount of feed water entering the distiller is dependent upon the condition of device "19", while the amount of brine leaving is dependent upon the condition of device "21".	See illustration number(s): MO-0111
14	1461	B	The intake and exhaust valves used in a diesel engine are returned to their seats by _____.	push rod pressure	spring force	combustion pressure	exhaust pressure	
14	1462	D	In a large, low-speed, main propulsion diesel engine, if the injectors have formed carbon around the nozzle holes, which of the following would help avoid further buildup?	Increase fuel injection pressure.	Increase fuel preheat temperature.	Decrease load limit on the governor.	Increase injector cooling water temperature.	
14	1463	B	When a leak has developed in the lube oil cooler of an operating diesel engine, which of the listed operating conditions can be expected to occur?	Lube oil contaminated with saltwater	Lube oil level decreases	Lube oil contaminated with fresh water coolant	Lube oil level increases	
14	1464	B	If the input signal rises above the setpoint of "17A", shown in the illustration, but remains below the setpoint of "17B", the output from "22A" will _____.	be the same as the setpoint of "17B"	indicate a pressure on "67A" equal to the setpoint of "17A"	indicate a pressure on "67A" equal to the input of "17A"	improve to a steady state when moisture is removed from the system	See illustration number(s): MO-0114
14	1465	C	What terminates the sludge discharge cycle of the device shown in the illustration?	The solenoid valve opens, directs high pressure fluid into the closing chamber, and results in an upward movement of the sliding piston.	The solenoid valve closes, reduces the water pressure to the paring chamber, and allows the spring force to move the sliding piston upward.	The solenoid valve closes, allows the water in the opening chamber to bleed off through "S", and the sliding piston moves upward due to the force developed in area "J".	The solenoid valve closes, allows the weight of the sliding piston to oppose the low water pressure, and moves it along the axis of the spindle.	See illustration number(s): MO-0112
14	1466	C	The force developed by the liquid within space "J" of the device shown in the illustration depends upon _____.	the speed of the bowl and the condition of seal "H"	the angular velocity at which the liquid travels	the speed of the bowl and the condition of seal "U"	inertia forces during starting and stopping	See illustration number(s): MO-0112
14	1467	D	The item indicated by the letter "F" of the device shown in the illustration is the _____.	guide band	guide pin	locating dowel pin	bowl gasket	See illustration number(s): MO-0112
14	1468	C	A six cylinder, two stroke/cycle diesel engine is 83% efficient and has a cylinder constant of 0.998 while operating with a mean effective pressure of 15 kg/cm2 at a speed of 100 RPM. What is the metric brake horse power developed?	5,559 kW	6,698 kW	7,455 kW	8,982 kW	
14	1469	B	If the jacket water temperature rises rapidly above normal in a diesel engine, you should FIRST _____.	place standby cooler in operation	reduce engine load	check thermostatic valve	clean sea water strainer	
14	1470	C	According to Coast Guard regulations, keel cooler installations are _____.	required on all vessels of less than 150 gross tons	to be made between the the bilge keel and the keel	to be provided with shutoff or isolation valves except when installed forward of the collision bulkhead	to be provided with expansion tanks, which must be located below the load line to provide positive cooling water flow	
14	1471	D	Valve cages are used on some large diesel engines to _____.	reduce wear on the valve stem	permit the use of alloy valve seat materials	reduce heat transfer from the valve seat	facilitate valve removal for servicing	

14	1472	A	A 16 cylinder main propulsion diesel engine is operating at 90% of full load. All cylinder exhaust temperatures are indicated at 950°F, except the No. 7 cylinder which is indicated at 1100°F. All fuel racks are at 21-22 mm except No. 7 which is at 16mm. The fuel injector nozzle for No. 7 cylinder was exchanged within the last 3 hours. Which of the listed actions should be carried out NEXT?	Replace and retime No. 7 cylinder fuel pump.	Pull No. 7 cylinder piston and examine the rings.	Examine the governor linkage for binding.	Check the intake manifold pressure for evidence of burned intake valves.	
14	1473	B	If the manufacturer advises of a normal lube oil consumption for a 4000 horsepower (2982.8 kW) diesel engine to be .0001 gal/hp-hr, (.5076 mL/kW-hr), how much oil should the engine consume in one 24 hour period if operated at full load?	6.4 gallons (24.23 L)	9.6 gallons (36.34 L)	11.4 gallons (43.15 L)	14.4 gallons (54.51 L)	
14	1474	B	The tube sheets installed in a fire-tube auxiliary boiler are normally connected by _____.	girder stays	fire-tubes and stay-tubes	external boiler plating	separate crown sheets	
14	1475	D	Under normal conditions, the main source of crankcase oil contamination is attributed to _____.	metal particles loosened by wear	air when air cleaners are not used	condensation of water vapors	breakdown of the lubricating oil by dilution	
14	1476	B	In a diesel engine, a cylinder liner should be replaced if it is _____. I. scuffed II. scored	I only is correct	II only is correct	both I and II are correct	neither I or II are correct	
14	1477	D	In a diesel engine cooling system, the high temperature alarm contact maker will be activated on excessively high water discharge temperature from the _____.	raw water pump discharge	expansion tank outlet	cooling water heat exchanger outlet	engine jacket water outlet	
14	1478	A	Cooling water pumps driven by direct reversing diesel engines are usually of the straight impeller vane type pump with a concentric housing to _____.	facilitate bi-directional operation	provide the greatest pump efficiency	prevent pump clogging from marine growth	prevent cavitation at the pump outlet	
14	1479	A	A diesel engine indicator diagram has an area of 22 cm2 and a length of 12.5 cm. If the scale of the indicator spring is 1 mm = 1 kg/cm2, what is the cylinder mean effective pressure?	17.6 kg/cm2	27.5 kg/cm2	34.5 kg/cm2	36.0 kg/cm2	
14	1480	A	One cause of diesel engine surging can be a result of _____.	injection pump plungers stuck or worn	low compression	solenoid stuck open	fuel tank too full	
14	1481	C	During warm-up the expansion of valve stems due to engine heat, is allowed for by the _____.	valve springs	hydraulic governor	valve lash	cooling system	
14	1482	B	In an operating diesel engine, preignition can be caused by _____.	excessively late fuel injection	oil in the air charge	water in the fuel	injection continuing after the fuel charge is ignited	
14	1483	D	Excessive lube oil consumption can result from worn or broken _____.	piston rings	valve guides	valve seals	all of the above	
14	1484	C	The illustrated diesel engine starting motor initially disengages the drive/clutch mechanism from the engine flywheel once the engine has started by _____.	de-energizing the solenoid	the potential retraction energy possessed by the return spring "D"	the mechanical interaction between the clutch and the splined sleeve	centripital force exerted by the rotating armature	See illustration number(s): MO-0051
14	1485	A	In a diesel engine, an integral liner is one in which the cooling water _____. I. flows through the cylinder liner jackets II. touches the outer side of the liner	I only	II only	both I and II	neither I nor II	
14	1486	C	In a diesel engine, when refitting piston rings you should_____. I. check the ring gap at the smallest diameter of the cylinder II. remove carbon from the ring groove	I only	II only	both I and II	neither I nor II	
14	1487	B	What is the metric brake horse power developed per cylinder by an 83% efficient, six cylinder, two-stroke/cycle diesel engine with a cylinder constant of 0.998 and a mean effective pressure of 15 kg/cm2 at 100 RPM?	1,497 kW	1,242 kW	1,116 kW	926 kW	

14	1488	B	The diesel engine starting motor returns the Bendix drive/ clutch mechanism to the position illustrated by _____.	reversing the direction of the starting motor	the higher peripheral speed of the flywheel	the potential energy of spring "D" once the solenoid has been de-energized	mechanical interaction of the left hand thread and the energy imparted by the rotation of the over-running clutch	See illustration number(s): MO-0051
14	1489	C	The engine cylinder illustrated is of the _____.	dry liner type	wet liner type	type integrally machined in the block	integral wet liner type	See illustration number(s): MO-0020
14	1490	B	A condition that can increase the foaming tendency of lube oil is _____.	excessively high oil temperatures	water or moisture contamination	fuel dilution	carbon suspension	
14	1491	B	In the cylinder head illustrated, the valves are seated by _____.	gas pressure	valve springs	air pressure	a rocker arm not shown	See illustration number(s): MO-0013
14	1492	B	If the diesel engine fuel injection timing is changed to delay the start of injection until the pistons are at top dead center, the engine will _____.	backfire through the air intake	develop less power under load	have high firing pressures	lift its cylinder relief valves	
14	1493	B	Excessive lubricating oil consumption in a running diesel engine can be caused by _____.	clogged lube oil piping	excessive valve-guide clearance	high lube oil viscosity	low lube oil temperature	
14	1494	B	Which of the following conditions is likely to develop if the thermocouple element of a pyrometer becomes coated with excessive amounts of combustion by-products?	Indicated exhaust pressure readings will increase.	Pyrometer responses will be retarded.	Indicated cylinder temperature readings will increase.	Indicated firing pressure readings will increase.	
14	1495	B	What is the swept volume per cylinder per revolution of a six-cylinder, two-stroke/cycle diesel engine with a 580 mm bore and a 1700 mm stroke operating at 100 RPM?	0.45 cubic meters (450 L)	0.90 cubic meters (900 L)	2.7 cubic meters (2700 L)	5.4 cubic meters (5400 L)	
14	1496	C	The illustration is of a/an _____.	power take-off driven, vane type, air compressor	battery powered, electric motor driven vane type, hydraulic pump	air driven starter motor assembly	air driven DC generator	See illustration number(s): MO-0044
14	1497	C	Which of the following statements represents the best method for tightening the illustrated head bolts?	Beginning with number 1 and moving clockwise, tighten each in consecutive order	Beginning with number 1 and moving counter clockwise, tighten each in consecutive order	Beginning with number 1, tighten it move directly opposite and tighten, then move 90° tighten and continue on	Beginning with number 1, tighten it, move to number 3 and tighten, then to number 7, then to number 5 and continue on	See illustration number(s): MO-0028
14	1498	A	The illustrated figure "A" represents _____.	a correctly tightened centrifuge bowl	fuel pump timing marks	fuel rack alignment marks	a strobascopic speed scale for timing	See illustration number(s): MO-0022
14	1499	C	The device labeled "B", shown in the illustration rotates at _____.	the same speed of the component labeled "7"	a speed not equal to that of the camshaft	the same speed of the crankshaft	the same speed of the device labeled "D"	See illustration number(s): MO-0122
14	1500	C	A seven cylinder, two-stroke/cycle, single acting diesel engine with a cylinder indicated horsepower calculated as 1350 kW and brake horsepower measured at 7466 kW has a mechanical efficiency of _____.	18%	55%	79%	83%	
14	1501	C	In a diesel engine, the spring force required for proper valve operation is determined by _____.	maximum firing pressure	minimum firing pressure	cam contour	length of the spring	
14	1502	D	Significant retardation of a diesel engine fuel injection timing will result in _____.	smoother engine operation	advanced fuel ignition	increased fuel economy	reduced engine power	
14	1503	D	In a four-stroke/cycle diesel engine, badly worn intake valve guides can cause excessive _____.	exhaust pressure	exhaust temperatures	cooling water temperatures	lube oil consumption	
14	1504	A	Forcing the exhaust gases from the cylinder of an operating diesel engine with the aid of a blower is known as _____.	scavenging	forced draft	turbocharging	aspiration	

14	1505	B	Which of the following statements concerning this type of illustrated, metal edge strainer is true?	As sludge and dirt accumulate on the outer surface of the strainer discs, the effectiveness of the strainer increases.	One turn of the T-handle is sufficient for cleaning the discs.	Particles of solid matter larger than the distances between the discs flow up through the inner space.	The strainer discs, spacers, and scraper blades are magnetic to prevent small metal particles from damaging the reduction gear.	See illustration number(s): MO-0057
14	1506	A	An acceptable means of tightening connecting rod and main bearing cap bolts is to measure the _____. I. torque applied to each nut and bolt assembly II. stretch of each nut before and after tightening	I only	II only	both I and II	neither I nor II	
14	1507	B	A condition contributing to diesel engine piston rings sticking in the ring grooves, is insufficient ring clearance at the ring _____. I. gap II. side	I only	II only	both I and II	neither I nor II	
14	1508	C	In a trunk type diesel engine piston, the thickness of the head or crown is determined by the _____. I. strength requirement II. heat dissipation requirement	I only	II only	both I and II	neither I nor II	
14	1509	A	A crankshaft whose center of gravity coincides with its center line is said to be _____. I. staticly balanced II. dynamically balanced	I only	II only	both I and II	neither I nor II	
14	1510	D	A seven cylinder, 2-stroke/cycle, single acting diesel engine has a 750 mm bore and a 2000 mm stroke. What indicated power will be developed if the average mean effective pressure is 14.8 kg/cm2 at a speed of 96 RPM?	1,959 kW	3,906 kW	7,182 kW	14,363 kW	
14	1511	B	The diesel engine shown in the illustration utilizes the type of cylinder construction identified as _____.	a dry liner	a wet liner	integral with a removable sleeve	integral with a non-removable sleeve	See illustration number(s): MO-0007
14	1512	D	Late fuel oil injection in a diesel engine can result in _____.	fuel knock	increased power	low compression pressure	high exhaust temperature	
14	1513	A	Which of the following problems represents one possible cause of high lube oil consumption in a four stroke diesel engine?	Worn intake valve guides	Pitted precombustion chambers	Loose valve tappets	High exhaust back pressure	
14	1514	C	Which segment of the cycle shown in the illustration represents "supercharging"?	I	II	III	IV	See illustration number(s): MO-0037
14	1515	C	Which of the indicator diagrams illustrated depicts the condition that should be corrected by the fitting of fewer or thinner shims to the connecting rod?	A	B	C	D	See illustration number(s): MO-0029
14	1516	A	The function of the illustrated device is to _____.	maintain cold lash adjustment	provide metered bypassing of lube oil in a bypass type lube oil system	act as a multi-pressure relief valve	quickly shut off fuel flow at the end of fuel injection	See illustration number(s): MO-0070
14	1517	A	The formula "Nplan/33,000" is equal to the _____.	IHP	BMEP	BHP	SHP	
14	1518	B	The RPM of "A" is 150 and hobbed with 94 teeth. If gears "B", "C", and "D" have 80, 30, and 46 teeth respectively, the RPM of "D" in the gear train illustration is _____.	114.95 RPM	817.39 RPM	695.65 RPM	97.83 RPM	See illustration number(s): MO-0088
14	1519	C	At bottom dead center, the centerline of the connecting rod usually coincides with the _____.	angularity of the piston motion	inertia moment from the piston	centerline of the cylinder	centerline of the king pin	
14	1520	C	In a diesel engine, when installing new piston rings it is important to check _____. I. ring gap clearance II. side clearance	I only	II only	both I and II	neither I nor II	
14	1521	A	A six cylinder 2-stroke/cycle, single acting diesel engine has a 580 mm bore and a 1700 mm stroke. What indicated power per cylinder will be developed if the average mean effective pressure is 15.3 kg/cm2 at a speed of 120 RPM?	1,348 kW	2,696 kW	4,044 kW	8,088 kW	

14	1522	D	When fuel is injected late into a diesel engine cylinder, _____.	the exhaust will be clear	fuel consumption will be low	all the fuel will be burned at top dead center	fuel consumption will be high	
14	1523	B	When using a fuel with a higher than normal sulfur content in an auxiliary diesel engine, you should _____.	maintain higher than normal jacket water temperature	change the lube oil more frequently than normal	maintain a higher air-box temperature than normal	maintain a higher air-box pressure than normal	
14	1524	B	In which of the scavenging methods listed will the exhaust valve be located in the cylinder head?	Return-flow	Uniflow	Crossflow	Direct flow	
14	1525	B	In a diesel engine, the contact surfaces of the piston compression rings are those in contact with the _____. I. back of the ring groove II. bottom of the ring groove	I only	II only	both I and II	neither I nor II	
14	1526	B	The purpose of an interference angle in a diesel engine exhaust valve is to _____. I. work in conjunction with valve rotators to rotate the valve II. break up seat deposits	I only	II only	both I and II	neither I nor II	
14	1527	A	Gear "D" hobbed with 42 teeth and rotates at a speed of 700 RPM. If gears "A", "B", and "C" have 42, 60, and 32 teeth respectively, the RPM of "A" in the gear train illustration is _____.	373.33 RPM	199.11 RPM	512.20 RPM	145.69 RPM	See illustration number(s): MO-0088
14	1528	B	Which of the indicator diagrams illustrated depicts the condition that should be corrected by advancing only the timing?	A	B	C	D	See illustration number(s): MO-0029
14	1529	C	Which of the listed devices could be used as a substitute for a ring grooving tool?	Steel brush	Fine emery cloth or steel wool	A section of the removed compression ring	A case hardened scraper	
14	1530	A	According to Coast Guard regulations, isolation valves used in keel cooler installations are permitted to be constructed of _____.	bronze	non-ductile cast iron	lead and cast iron alloys	zinc and antimony alloys	
14	1531	B	The cylinder liner forming the cylinder wall and the inside of the water jacket is called a _____.	dry liner	wet liner	jacket liner	corrugated liner	
14	1532	A	In a diesel engine, late fuel injection is indicated by black or gray exhaust smoke with _____.	low firing pressure	low exhaust temperature	mechanical knock in each cylinder	fuel knock in each cylinder	
14	1533	D	Metal particles accumulated from the wearing of components in a diesel engine can result from lube oil that has been contaminated with _____.	abrasive particles	metallic oxides	corrosive acids	any or all of the above	
14	1534	B	Some diesel engines are supercharged with a _____.	slam charger	turbocharger	fuel atomizer	fuel injector	
14	1535	B	In the diesel engine shown in the illustration, what part is under compression when a particular cylinder is firing?	Tie rod	Piston rod	Turbocharger	Lubrication telescopes	See illustration number(s): MO-0003
14	1536	A	In a coil-type forced circulation auxiliary water-tube boiler, _____.	steam demand response is comparatively rapid	steam is recirculated through heating coils in the boiler	unevaporated feedwater is discharged through the skim tube	steam demand response is slow	
14	1537	A	Kingsbury thrust bearings are lubricated by _____. I. a flooded housing II. oil spray on collar and shoes	I only	II only	either I or II	neither I nor II	
14	1538	C	A diesel engine valve spring is under compression when the valve is _____. I. open II. closed	I only	II only	both I and II	neither I nor II	
14	1539	B	Misalignment of the drive shaft and propeller shaft flanges can be detected by using a dial indicator or _____.	inside micrometer	feeler gage and straight edge	adjustable trammel	sighting device	

14	1540	C	The device labeled "B", shown in the illustration rotates at _____.	one half the speed of the component labeled "10"	a speed not equal to that of the camshaft	the same speed of the device labeled "T"	the same speed of the device labeled "N"	See illustration number(s): MO-0122
14	1541	A	Which type of diesel engine cylinder liner is shown in the illustration?	Dry liner	Wet liner	Jacket liner	Wet jacket liner	See illustration number(s): MO-0021
14	1542	C	A diesel engine will lose power if fuel injection occurs too late in the cycle, because the _____.	fuel droplets will burn as they leave the fuel injector	fuel will not be properly atomized in the cylinder	maximum expansion of the burned fuel cannot take place in the cylinder	compression pressure will be too low to cause fuel ignition	
14	1543	B	In a diesel engine, blow-by _____.	increases exhaust back pressure	causes excessive crankcase pressure	can only be detected by a compression check	decreases fuel consumption	
14	1544	D	The process of supplying a diesel engine cylinder with air at a pressure greater than atmospheric is called _____.	engine displacement	super-aspirating	air injection	supercharging	
14	1545	A	The purpose of an interference angle in a diesel engine exhaust valve is to _____. I. break up seat deposits II. work in conjunction with valve rotators to rotate the valve	I only	II only	both I and II	neither I nor II	
14	1546	A	A four cylinder, four stroke/cycle, single acting diesel engine has a 740 mm bore and a 1500 mm stroke. What indicated power will be developed if the average mean effective pressure is 18 kg/cm2 at a speed of 90 RPM?	3416 kW	4644 kW	7296 kW	9290 kW	
14	1547	B	Excessive piston ring wear in a diesel engine will cause _____.	high lube oil viscosity	abnormal lube oil consumption	low lube oil temperatures	high firing pressures	
14	1548	A	The RPM of "D" is 900 and hobbed with 36 teeth. If gears "A", "B", and "C" have 72, 64, and 24 teeth respectively, the RPM of "A" in the gear train illustration is _____.	168.75 RPM	112.50 RPM	100.00 RPM	800.00 RPM	See illustration number(s): MO-0088
14	1549	B	Which of the contaminants listed would remain in the lube oil after filtering?	Acid sludge	Fuel oil	Sediment	Water	
14	1550	C	According to Coast Guard regulations, keel cooler installations are _____.	required on all vessels of less than 150 gross tons	to be constructed as independent heat exchangers	permitted to be part of the vessel's hull as long as the material is of the same quality and thickness as the hull	to be provided with expansion tanks, which must be located below the load line to provide positive cooling water flow	
14	1551	B	Which of the listed types of cylinder liners is used in the diesel engine shown in the illustration?	Dry	Wet	Ported jacket	Caston jacket	See illustration number(s): MO-0007
14	1552	B	Late fuel injection timing is indicated by _____.	lower than normal cylinder pressure and low exhaust temperature	lower than normal cylinder pressure and high exhaust temperature	higher than normal cylinder pressure and low exhaust temperature	higher than normal cylinder pressure and high exhaust temperature	
14	1553	C	If the analysis of used lube oil indicates a high content of iron particles, this could indicate _____.	corrosive deterioration of a bearing	inadequate air filtration	excessive ring and liner wear	excessive cooling of lubricating oil	
14	1554	B	The exhaust system for a turbocharged diesel engine functions to _____.	power the aftercoolers	power the turbocharger	reduce the cylinder scavenge effect	cool the turbocharger	
14	1556	C	The speed droop characteristics of two similar diesel engines, driving two similar DC generators, are connected in parallel. From the illustrated diagram, determine which of the following statements is true.	Engine "B" will take a greater part of the load than engine "A".	Engine "B" will operate at a lower RPM than engine "A" when operating alone.	Engine "B" will take lesser part of the load than Engine "A".	Engine "B" will operate at a higher RPM than engine "A".	See illustration number(s): MO-0109
14	1557	D	Which type of pump is typically used to supply fuel to a unit type auxiliary boiler?	Centrifugal	Propeller	Reciprocating	Rotary	

14	1558	B	The RPM of "D" is 900 and hobbed with 48 teeth. If gears "A", "B", and "C" have 88, 66, and 22 teeth respectively, the RPM of "A" in the gear train illustration is _____.	75.00 RPM	163.64 RPM	100.00 RPM	675.00 RPM	See illustration number(s): MO-0088
14	1559	C	In a medium speed diesel engine, a trunk type piston may be cooled by _____. I. oil circulation though passages in the piston crown II. heat transfer through piston rings and liner wall	I only	II only	either I or II	neither I or II	
14	1560	B	In a diesel engine jacket water cooler, with seawater cooling the fresh water, the _____.	sea water temperature must never be warmer than 40°F	jacket water pressure should always be greater than the sea water pressure	jacket water temperature must always be less than 60°F	jacket water pressure must always be less than the sea water pressure	
14	1561	B	The cylinder liner shown in the illustration is a/an _____.	dry liner	wet liner	integral-jacket liner	sealed-jacket liner	See illustration number(s): MO-0007
14	1562	A	Late fuel injection in a diesel engine is indicated by low firing pressure with _____.	high exhaust temperature	low exhaust temperature	fuel knock in each cylinder	mechanical knock in each cylinder	
14	1563	B	If a used lube oil analysis indicates an excessive chromate content, this means _____.	air filtration is inadequate	engine coolant is leaking into the lube oil	fuel oil is leaking into the lube oil	the piston rings are excessively worn	
14	1564	D	Which of the following beneficial results can be expected from supercharging a previously naturally aspirated engine?	Increased turbulence	Increased mechanical efficiency	Increased brake mean effective pressure	All of the above.	
14	1565	D	As illustrated, what is the maximum allowable clearance permitted between the bearing and the shaft along its vertical axis?	1.00 mm	0.30 mm	0.46 mm	0.80 mm	See illustration number(s): MO-0121
14	1566	C	If an auxiliary diesel engine coolant temperature is higher than normal, but the thermostat is determined not to be defective, you would suspect a/an _____.	cavitation erosion in the water jackets	excess corrosion inhibitor in the coolant	dirty jacket water cooler	defective turbocharger	
14	1567	B	The microbiological growths that affect fuel supplies can easily be transported from one location to another by _____.	roaches and other insects	air, solids, or liquids	other non-hydrocarbon fuels	All of the above	
14	1568	D	Using a diesel engine indicator P-V diagram, the cylinder mean effective pressure is calculated to be 21.3 kg/cm2. What is the scale of the spring used on the indicator if the diagram area is 18.46 cm2 with a length of 13 cm?	9.0 kg/cm	10.0 kg/cm	12.5 kg/cm	15.0 kg/cm	
14	1569	A	The pressure differential across a diesel engine lube oil system duplex filter should be checked to _____.	determine the need for filter changing	measure any change in oil viscosity	prevent damage to the filter	determine the need for batch filtration	
14	1570	C	The illustrated device is operated directly by _____.	a rocker arm and push rod	cam action	fuel oil pressure	excessively high combustion pressure	See illustration number(s): MO-0041
14	1571	C	In a unit injector the amount of fuel that will be forced through the spray nozzle on each stroke of the plunger depends on _____.	the pump supply pressure	the slope of the fuel cam	how the plunger is rotated	the number of sleeve segments engaged with the rack	
14	1572	B	Late fuel injection occurring at, or after TDC in a diesel engine is indicated by excessive exhaust smoke and _____.	low exhaust temperature	low firing pressure	fuel knock in each cylinder	mechanical knock in each cylinder	
14	1573	D	Oil oxidation as a result of excessively high lube oil temperature, is harmful to a diesel engine because _____.	oil foaming will always occur	large quantities of oil are consumed	lube oil viscosity is always decreased	corrosive by-products are usually formed	
14	1574	A	Compared to a naturally aspirated diesel engine, a supercharged diesel engine has _____.	a cylinder air charge of higher pressure	increased pumping losses	less valve overlap	reduced blow-by	
14	1575	A	The RPM of "A" is 150 and hobbed with 86 teeth. If gears "B", "C", and "D" have 66, 22, and 48 teeth respectively, the RPM of "D" in the gear train illustration is _____.	806.25 RPM	89.58 RPM	618.75 RPM	68.75 RPM	See illustration number(s): MO-0088
14	1576	A	The combustion of fuel for the illustrated engine is initiated by _____.	a spray of fuel into a turbulence combustion chamber	fuel sprayed into an energy cell	fuel injection provided by a unit injector	individual Bosch fuel pumps	See illustration number(s): MO-0020

14	1577	A	If the plunger or barrel of a fuel injection jerk pump becomes damaged, _____.	the entire pump must be replaced	the injection pump and injection nozzle must be replaced	either the barrel or plunger must be replaced	the barrel and plunger must be lapped and blued.	
14	1578	C	When one cylinder has a lower compression pressure and higher exhaust gas temperature than any of the other engine cylinders, which of the conditions listed will be indicated?	Advanced ignition	Clogged air intake	Leaky exhaust valve	High exhaust pressure	
14	1579	C	What is the average piston speed of a seven-cylinder, two-stroke/cycle diesel engine with a 580 mm bore and a 1700 mm stroke operating at 100 RPM?	2.8 m/sec	4.5 m/sec	5.7 m/sec	9.0 m/sec	
14	1580	D	Starting aids such as glow plugs, are installed on _____.	large, direct drive diesel engines	diesel engines designed to burn residual fuels	medium-speed, four-stroke/cycle diesel engines	small diesel engines utilizing electric starting equipment	
14	1581	B	The bore of a diesel engine cylinder describes the _____.	swept volume of the cylinder	inside diameter of the cylinder	piston displacement in the cylinder	length of the piston stroke	
14	1582	D	Late fuel injection in a diesel engine is indicated by low firing pressure with _____.	low exhaust temperature	low exhaust pressure	mechanical knock in each cylinder	black or gray exhaust smoke	
14	1583	B	The quantity of air delivered at any given speed by a Roots-type blower, as shown in the illustration, decreases as the pressure ratio increases. This is due to the _____.	decrease in clearance between the mating lobes	increase in air leakage past the rotors	decrease in air leakage past the rotors	increase in clearance between the mating lobes	See illustration number(s): MO-0082
14	1584	D	Which of the listed pre-start procedures should be carried out prior to starting a crosshead type diesel engine after an overhaul?	Prelube cylinders with hand cranks.	Open all air space drain cocks.	Open all indicator valves.	All of the above.	
14	1585	B	The direct acting mechanical governor used with some small diesel engines, controls fuel flow to the engine by _____.	governor flyweight action on a pilot valve which controls fuel injection	governor flyweight motion acting on fuel controls through suitable linkage	positioning a butterfly valve in the fuel delivery system	positioning a servomotor piston attached to the fuel controls	
14	1586	A	The speed droop characteristics of two similar diesel engines, driving two similar AC generators, are connected in parallel. From the illustrated diagram, determine which of the following statements is true.	Engine "A" will take a greater part of the load than engine "B".	Engine "B" will operate at a lower RPM than engine "A" when operating alone.	Engine "A" will take lesser part of the load than Engine "B".	Engine "B" will operate at a higher RPM than engine "A".	See illustration number(s): MO-0109
14	1587	A	The RPM of "A" is 100 and hobbed with 72 teeth. If gears "B", "C", and "D" have 64, 24, and 36 teeth respectively, the RPM of "D" in the gear train illustration is _____.	533.33 RPM	112.50 RPM	711.11 RPM	100.00 RPM	See illustration number(s): MO-0088
14	1588	B	The RPM of "A" is 150 and hobbed with 78 teeth. If gears "B", "C", and "D" have 60, 32, and 42 teeth respectively, the RPM of "D" in the gear train illustration is _____.	148.57 RPM	522.32 RPM	401.79 RPM	114.29 RPM	See illustration number(s): MO-0088
14	1589	C	The RPM of "A" is 150 and hobbed with 82 teeth. If gears "B", "C", and "D" have 62, 20, and 38 teeth respectively, the RPM of "D" in the gear train illustration is _____.	104.41 RPM	758.68 RPM	1003.42 RPM	78.95 RPM	See illustration number(s): MO-0088
14	1590	D	The RPM of "A" is 150 and hobbed with 84 teeth. If gears "B", "C", and "D" have 64, 24, and 36 teeth respectively, the RPM of "D" in the gear train illustration is _____.	131.25 RPM	711.11 RPM	100.00 RPM	933.33 RPM	See illustration number(s): MO-0088
14	1591	C	The purpose of counterboring the top of the cylinder liner, extending down to the top point of travel of the top compression ring, is to _____.	increase cylinder turbulence	prevent wear of the liner from occurring	prevent wear of the liner from forming a ridge at the upper level of ring travel	decrease compression ratio for easier starting	
14	1592	A	Late fuel injection in a diesel engine is indicated by black or gray exhaust smoke with a _____.	low firing pressure	low exhaust temperature	mechanical knock in each cylinder	fuel knock in each cylinder	
14	1593	A	A decrease in the flash point of the diesel engine lube oil indicates the lube oil is _____.	diluted with fuel oil	diluted with water	contaminated with carbon	contaminated with sludge	

14	1594	B	A supercharged diesel engine, when compared to a similar naturally aspirated diesel engine, will develop an increase in _____.	ignition lag	engine horsepower	lube oil system pressure	specific fuel consumption	
14	1595	C	According to Coast Guard Regulations (46 CFR), the maximum allowable boiler pressure in which a tubular gage glass may be installed is _____.	100 psig	200 psig	250 psig	300 psig	
14	1596	A	The RPM of "D" is 800 and hobbed with 38 teeth. If gears "A", "B", and "C" have 80, 62, and 20 teeth respectively, the RPM of "A" in the gear train illustration is _____.	122.58 RPM	64.52 RPM	83.25 RPM	620.00 RPM	See illustration number(s): MO-0088
14	1597	C	The RPM of "D" is 500 and hobbed with 42 teeth. If gears "A", "B", and "C" have 42, 60, and 32 teeth respectively, the RPM of "A" in the gear train illustration is _____.	147.37 RPM	142.22 RPM	266.67 RPM	394.74 RPM	See illustration number(s): MO-0088
14	1598	C	The RPM of "D" is 700 and hobbed with 38 teeth. If gears "A", "B", and "C" have 82, 62, and 20 teeth respectively, the RPM of "A" in the gear train illustration is _____.	72.84 RPM	529.27 RPM	104.64 RPM	55.07 RPM	See illustration number(s): MO-0088
14	1599	C	Which of the following statements represents the best method for tightening the illustrated head bolts?	Beginning with number 1 and moving clockwise, tighten each in consecutive order	Beginning with number 1 and moving counter clockwise, tighten each in consecutive order	Beginning with number 1, tighten it move directly opposit and tighten, then move 90° tighten and continue on	Beginning with number 1, tighten it, move to number 3 and tighten, then to number 7, then to number 5 and continue on	See illustration number(s): MO-0028
14	1600	C	If the speeder spring of a main propulsion diesel engine governor breaks while operating at full load, the engine RPM will _____.	increase until the overspeed trip actuated	hunt until stabilized by the droop rod	decrease to a slightly lower value	remain the same until manually changed	
14	1601	C	The sludge tank installed in the diesel engine room is used to collect _____. I. sludge from the fuel oil settling tanks and centrifuge II. water that has been collected in the settling tank.	I only	II only	both I and II	neither I or II	
14	1602	D	If a few injector spray holes become plugged, the result could be _____.	excessive surging at governed speed	combustion knock under load	poor fuel combustion	all of the above	
14	1603	A	Which of the following conditions is most likely to occur when unburned fuel contaminates the crankcase of a diesel engine?	Lube oil is diluted and its viscosity is reduced.	Sulfuric acid is formed.	Bearings become pitted and immediately fail.	Valve stems develop sludge deposits.	
14	1604	D	Which of the following conditions is realized by the turbocharging of a previously naturally aspirated diesel engine?	Ignition lag increases.	Lube oil system pressure increases.	Brake specific fuel consumption increases.	Mechanical efficiency increases.	
14	1605	C	The function of the device shown in the illustration is to _____.	slide the camshafts to insure proper lubrication	provide the engine with a braking device	change the engines direction of rotation	eliminate the need for mechanical interlocks	See illustration number(s): MO-0125
14	1606	A	Which of the indicator diagrams illustrated depicts the condition that should be corrected by retarding only the timing?	A	B	C	D	See illustration number(s): MO-0029
14	1607	D	A piston is said to be at top dead center when it is _____.	opening the exhaust ports	placed on top of the engine along its centerline	farthest from the cylinder head	nearest to the cylinder head	
14	1608	B	If the speed of a turbocharged diesel engine is maintained constant the turbocharger speed will _____.	decrease until the engine speed increases	increase as the load increases	decrease as the load increases	remain unchanged as the load decreases	
14	1609	D	The device labeled "T", shown in the illustration rotates at _____.	one half the speed of the component labeled "10"	a speed not equal to that of the camshaft	the same speed of the device labeled "N"	the same speed of the device labeled "B"	See illustration number(s): MO-0122
14	1610	C	At top dead center, the centerline of the connecting rod usually coincides with the _____.	angularity of the piston motion	inertia moment from the piston	centerline of the cylinder	centerline of the king pin	

14	1611	D	Why are some diesel engine cylinder liners plated on the wearing surface with porous chromium?	The chromium will not wear out the piston rings.	The chromium strengthens the liners in the way of the scavenging air ports.	Chromium eliminates the need for oil scraper rings.	Pores in the plating aid in maintaining the lube oil film.	
14	1612	D	A distorted spray pattern from a fuel injector can cause a diesel engine to have _____.	higher firing pressure	more power output	lower fuel pressure	less power output	
14	1613	A	Which of the listed bearing types is an example of a solid bearing?	Piston wrist pin bushing	Turbine bearing	Spring bearing	Diesel engine main bearing	
14	1614	B	The process of scavenging a two-stroke/cycle diesel engine serves to _____.	improve fuel flow volume	cool the exhaust valves	reduce the intake air charge density	increase the temperature of exhaust gases	
14	1615	C	In a diesel engine, what is the advantage of precombustion chambers over the open type of combustion chamber? I. Precombustion chambers permit coarser fuel atomization. II. Precombustion chambers allow lower fuel injection pressure.	I only	II only	both I and II	neither I nor II	
14	1616	A	A diesel generator has just been paralleled with an AC turbogenerator, but the load can not be properly divided. This could be caused by _____.	an incorrect diesel generator governor speed droop adjustment	a faulty reverse power relay within the main circuit breaker assembly	unsynchronized isochronous load distribution adjustments	a different speed setting on each unit	
14	1617	B	The term "diesel engine scavenging" means _____.	delivering more air into the cylinder than it would normally receive during an ordinary charging process	forcing the products of combustion out of the cylinder with the fresh air charge	collecting the air charge at the air cleaner	combustion and expansion of hot gas	
14	1618	C	Most large, low-speed, main propulsion diesel engines use duplex lube oil strainer to _____.	decrease the time required between cleanings	remove water contamination	ensure a positive flow of oil at all times	ensure that all lube oil has been treated twice	
14	1619	D	Which of the following statements concerning the systems shown in the illustration is correct?	The jacket water primarily looses its heat at the cooler and is further cooled in the evaporator section.	The feed water acquires heat passing through devices "2" and "23".	The jacket water absorbs heat in the evaporator section, while giving up its heat in the distiller section.	The feed water gains heat in section "23", while the vapor gives up heat in section "24".	See illustration number(s): MO-0111
14	1620	B	In a large low-speed diesel engine excessive piston clearance can be restored by _____.	decreasing the thickness of the cylinder head gasket	inserting shims between the crankpin bearing box and the connecting rod foot	replacing the complete bearing set	rotating the crankpin bearing until the proper end clearance is obtained	
14	1621	C	A method of finishing diesel engine cylinder walls to aid in the proper ring seating and lubrication is known as _____.	ribbed honing	angled honing	cross hatch honing	doubled honing	
14	1622	D	Plugged spray holes in a diesel engine fuel injector will cause excessive smoking at idling speed, in addition to _____.	damage to pistons or cylinder heads	detonation throughout the load range	preignition throughout the load range	excessive smoking when the engine is under load	
14	1623	B	One device used to determine the amount of fuel dilution of diesel engine lube oil is a/an _____.	autogenous ignition indicator	viscosity-dilution chart	precipitation number indicator	modified neutrality chart	
14	1624	D	Air scavenging of a diesel engine cylinder _____.	blows out the exhaust gases	supplies oxygen for combustion	cools the valves and cylinder walls	all of the above	
14	1625	D	Which of the indicator diagrams illustrated indicates the condition that should be corrected by retarding the timing, and the fitting of thicker shims to the connecting rod?	A	B	C	D	See illustration number(s): MO-0029

14	1626	D	Which of the following statements describes the operational characteristics of valve cam, figure "B" shown in the illustration?	Full valve opening will occur slowly.	The valve will reseat abruptly.	The valve gear will not bounce.	The valve will reseat gradually.	See illustration number(s): MO-0045
14	1627	A	The upper leveling plates in a Kingsbury thrust bearing are held in place by _____.	pins through the base ring	buttons on the thrust shoes	pivots on the thrust collar	screw dowels in the base ring	
14	1628	B	A distorted furnace in a fire-tube auxiliary boiler may be the result of _____.	firing for extended periods in the low fire mode	overheating, due to waterside deposits	varying the water level above the crown sheet	carrying excessive alkalinity in the boiler water	
14	1629	C	Higher than normal temperature air passing through the intake of a diesel engine will result in _____.	greater overall efficiency	greater fuel economy	lower horsepower	lower compression ratio	
14	1630	C	The rate of pressure rise during the period following fuel ignition in a diesel engine is influenced by the length of the ignition delay period due to the _____.	valve overlap	volumetric efficiency	turbulence of the air change	fuel efficiency	
14	1631	D	After a long period of operation, a wear ridge, caused by piston ring action, will develop near the top of the cylinder liner. This ridge must be removed when piston rings are renewed in order to prevent _____.	excessive wear during the seating period	excessive lubrication of the top ring	improper spreading of lubrication on the cylinder wall	breaking of the top ring, ring land, or both	
14	1632	C	Distortion of the spray pattern of a nozzle or injector may be indicated by a/an _____.	high firing pressure	overload of that particular cylinder	smoky exhaust	cooling water temperature rise	
14	1633	B	Lube oil filters can be used to remove most contaminants from lube oil. Which of the contaminants listed would remain in the lube oil after filtering?	Acid sludge	Fuel oil	Sediment	Water	
14	1634	B	A diesel engine is supercharged in order to _____.	lower the no-load RPMs	provide more air for combining with the fuel	increase the no-load RPMs	provide more fuel for combining with the air	
14	1635	A	The RPM of "D" is 500 and hobbed with 36 teeth. If gears "A", "B", and "C" have 72, 64, and 24 teeth respectively, the RPM of "A" in the gear train illustration is _____.	93.75 RPM	70.31 RPM	444.44 RPM	62.50 RPM	See illustration number(s): MO-0088
14	1636	B	The illustrated piston rings are located at _____.	the top of the ring belt	the lower part of the ring belt	the middle of the ring belt	each ring groove of the ring belt	See illustration number(s): MO-0015
14	1637	C	The device shown in figure A of the illustration is used to _____.	inject fuel into the cylinder	admit starting air to the cylinder	provide lubrication of cylinder	provide adapter to obtain combustion pressure readings	See illustration number(s): MO-0042
14	1638	B	The component identified as item #15 is used to _____.	test injector popping pressure	stop fuel delivery to the injector	advance fuel pump timing	increase the fuel pump delivery pressure	See illustration number(s): MO-0016
14	1639	C	Fuel delivery to the cylinder is terminated when the _____.	hexil on component "H" uncovers the spill port	cam follower is located on the base circle	spill valve opens	safety shut down valve opens	See illustration number(s): MO-0097
14	1640	D	The device shown in the illustration may be closed by using scavenging air pressure on some recently built engines and would replace the component identified as _____.	"E"	"F"	"H"	"J"	See illustration number(s): MO-0066
14	1641	B	A properly honed diesel engine cylinder liner will _____.	prevent piston ring wear	shorten the ring break-in period	prevent cylinder liner glazing	appear slick and glazed	
14	1642	A	When the opening pressure of a diesel engine fuel injector is greater than that specified by the engine manufacturer, which of the following problems can be expected?	Quantity of fuel injected tends to be decreased.	Quantity of fuel injected will always be increased.	Start of injection tends to be advanced.	Duration of injection will always be greater.	
14	1643	D	Which of the following conditions could be a cause of excessive fuel dilution of diesel engine lube oil?	Leaking fuel injectors	Lower than normal compression	Delayed fuel injection	All of the above are correct.	
14	1644	C	If governor Item #19 in the illustration were to break on a main propulsion diesel engine operating under full load, the engine RPM will _____.	increase until the overspeed trip actuated	hunt until stablized by droop rod	decrease to a slightly lower value	remain the same until manually changed	See illustration number(s): MO-0095

14	1645	A	The device shown in the illustration is classified as a/an _____.	comparator type mist detector	exhaust gas vapor condenser	Ringleman exhaust gas analyser	reflective type explosion meter	See illustration number(s): MO-0008
14	1646	A	The device shown in the illustration is classified as a/an _____.	comparator type mist detector	exhaust gas vapor condenser	Ringleman exhaust gas analyser	reflective type explosion meter	See illustration number(s): MO-0008
14	1647	D	The device shown in the illustration is classified as a/an _____.	rotary type mist detector to be used for high speed, four stroke diesel engines	photo-electric type mist detector used in high speed, two-stroke, trunk piston engines	Ringleman type smoke detector as designed for large low speed engines	level type mist detector, designed for small high speed trunk piston engines	See illustration number(s): MO-0009
14	1648	A	The device shown in the illustration operates on the basic principle of _____.	photo-electric cell theory	variation of specific volume of a vapor	venturi effect (square root of vapor velocity)	kinetic energy imparted through centripital force	See illustration number(s): MO-0009
14	1649	D	The termination of fuel injection for a large low speed diesel engine is initiated by _____.	rotation of part #433	valve action of part #436	pressure applied to component #511	movement of rod #581	See illustration number(s): MO-0106
14	1650	C	The valve gear shown in the illustration is for a four-stroke/cycle, medium speed, diesel engine, with fuel injection commencing in at 10° Before TDC. Approximately how many crankshaft degrees from the point at which fuel injection begins, does the exhaust valve push rod begin to move up?	90°	90°-120°	130°-160°	180°-190°	See illustration number(s): MO-0013
14	1651	D	In the diesel engine shown in the illustration, the space below the cylinder liner lower seals is subjected to _____.	scavenge air pressure	lube oil pressure	cooling water pressure	crankcase pressure	See illustration number(s): MO-0005
14	1652	A	When a fuel injection nozzle overheats, which of the problems listed can be expected?	The fuel metering will vary.	The fuel will explode.	The cylinder head will crack.	The engine will stop.	
14	1653	D	Fuel oil contamination of an auxiliary diesel engine lube oil can result in _____.	an increased flash point	higher lube oil pressures	an increased viscosity	lower lube oil pressures	
14	1654	D	Which of the following devices will increase the power output of a diesel engine without increasing its frictional load?	Positive displacement blower	Roots-type rotary blower	Gear-driven centrifugal blower	Turbine-driven centrifugal blower	
14	1655	C	The component labled as part #20 in the illustration is used to _____.	meter the amount of oil flow to the cylinder lubricating quill	adjust the timing of the cylinder lubricating oil to the cylinder	indicate the quantity of oil flow to the cylinder	prevent the backflow of oil and combustion gases	See illustration number(s): MO-0050
14	1656	D	A diesel engine piston crown can crack from _____.	excessive piston to liner clearance	excessive dirt beneath the piston crown that reduces heat transfer.	faulty nozzle spray	all of the above	
14	1657	C	In the illustrated diesel engine, which lable points to the piston?	K	3	4	6	See illustration number(s): MO-0122
14	1658	A	Scavenging in a turbocharged, four-stroke/cycle diesel engine is accomplished _____.	during the valve overlap period	with only the exhaust valve open	at a pressure below atmospheric	without cooling the cylinders or pistons	
14	1659	D	The ignition quality of diesel fuel becomes less critical as _____.	the amount of lube oil additives increase	piston speeds increase	injection pressures decrease	engine speeds decrease	
14	1660	A	The RPM of "A" is 100 and and has 76 teeth. If gears "B", "C", and "D" have 60, 32, and 42 teeth respectively, the RPM of "D" in the gear train illustration is _____.	339.29 RPM	96.51 RPM	267.86 RPM	76.19 RPM	See illustration number(s): MO-0088
14	1661	A	The lower water seal on a diesel engine wet cylinder liner must allow for liner axial movement. This seal is most commonly a _____.	neoprene O-ring	soft copper gasket	precision ground flange joint	flexible metallic seal ring	
14	1662	B	If the firing pressures in a diesel engine are high, although the exhaust temperatures are normal, the cause may be _____.	early injection timing	worn orifices in the injection nozzles	worn or scored cylinder liners	using a fuel with too low of a cetane number	
14	1663	D	Diesel engine lube oil can become contaminated as a result of _____.	the water produced during combustion	the sulfur in the fuel	unburned fuel oil	all of the above	

14	1664	D	Which of the following statements represents the proper order of thrust transmission when a Kingsbury thrust bearing is used with diesel propulsion?	Engine shaft, thrust collar, thrust bearing housing, and thrust shoes	Engine shaft, thrust shoes, thrust collar, and thrust bearing housing	Propeller shaft, thrust shoes, thrust bearing housing, and thrust collar	Propeller shaft, thrust collar, thrust shoes, and thrust bearing housing	
14	1665	C	The device shown in the illustration is a _____.	rotary type mist detector, designed for use in four-stroke, high speed diesel engines	photo-electric, explosive gas indicator, for use in high speed, two-stroke, trunck type piston engines	comparator type mist detectors for large low speed, cross head engines	level type explosimeter, for small medium speed, trunk piston type engines	See illustration number(s): MO-0008
14	1666	D	The RPM of "D" is 600 and has 48 teeth. If gears "A", "B", and "C" have 84, 66, and 22 teeth respectively, the RPM of "A" in the gear train illustration is _____.	111.63 RPM	66.67 RPM	460.47 RPM	114.29 RPM	See illustration number(s): MO-0088
14	1667	B	The RPM of "D" is 600 and has 46 teeth. If gears "A", "B", and "C" have 94, 80, and 30 teeth respectively, the RPM of "A" in the gear train illustration is _____.	84.38 RPM	110.11 RPM	510.64 RPM	71.81 RPM	See illustration number(s): MO-0088
14	1668	B	The RPM of "A" is 100 and and has 80 teeth. If gears "B", "C", and "D" have 62, 20, and 38 teeth respectively, the RPM of "D" in the gear train illustration is _____.	67.91 RPM	652.63 RPM	505.79 RPM	52.63 RPM	See illustration number(s): MO-0088
14	1669	C	The RPM of "A" is 100 and has 88 teeth. If gears "B", "C", and "D" have 66, 22, and 48 teeth respectively, the RPM of "D" in the gear train illustration is _____.	61.11 RPM	412.50 RPM	550.00 RPM	45.83 RPM	See illustration number(s): MO-0088
14	1670	A	Cooling water pumps driven by direct reversing diesel engines are usually of the straight impeller vane type pump with a concentric housing to _____.	to turn in either direction	provide the greatest pump efficiency	prevent pump clogging from marine growth	prevent cavitation at the pump outlet	
14	1671	D	Which of the diesel engine cylinder liners listed has internal cooling water passages?	Internally finned liner.	Externally finned liner.	Wet liner.	Integral water-jacket liner.	
14	1672	C	If a single cylinder relief valve on a diesel engine lifts frequently while the engine is running, the cause may be an _____.	excessively late injection timing for each cylinder	incorrectly adjusted intake valve timing	incorrectly adjusted fuel injector	incorrectly adjusted intake valve clearance	
14	1673	D	Which of the following conditions indicates the dilution of diesel engine lube oil by fuel oil?	Water discharging from the waste water outlet of the lube oil purifier.	Fuel oil discharging from the waste water outlet of the lube oil purifier.	Lube oil discharging from the waste water outlet of the lube oil purifier.	A change in the lube oil viscosity.	
14	1674	C	Which of the turbocharging systems listed operates with the least average back pressure in the exhaust manifold?	Constant volume	Constant pressure	Pulse pressure	Radial flow	
14	1675	C	The exhaust valve opens before bottom dead center in a four stroke engine to_____. I. allow for blow down II. reduce pumping losses	I only	II only	both I and II	neither I nor II	
14	1676	A	The illustrated device is used to _____.	meter cylinder lubricating oil to the engine	meter fuel oil to the injectors	admit the correct amount of starting air to the cylinders in proper order	actuate exhaust valves in the correct sequence	See illustration number(s): MO-0050
14	1677	B	The line identified as "I" in the illustration is used to _____.	deliver fuel oil to the injector	supply lubricating oil for actuating the exhaust valve	exhaust gas and vapors from the power cylinder	deliver cooling water to the exhaust valve actuating device	See illustration number(s): MO-0066
14	1678	D	The device shown in the illustration is opened by force as provided by _____.	pneumatic pressure	spring pressure	scavenging air pressure	hydraulic pressure	See illustration number(s): MO-0066
14	1679	A	An operating turbocharged diesel engine that suddenly loses power, is due to a/an _____.	restricted turbocharger air intake	oil leak into the turbocharger	dribbling injector	low fuel viscosity	
14	1680	C	The Total Base Number(TBN) value of diesel engine lube oil refers to its ability to _____.	resist changes in viscosity with changes in temperature	resist emulsification	neutralize acids	resist oxidation at high temperatures	

14	1681	B	A dry-type exhaust muffler clogged with soot, will cause _____.	low exhaust temperature	loss of engine power	burned intake valves	engine racing	
14	1682	A	Which of the following problems will occur if the needle valve in a fuel injection nozzle sticks in the open position?	Fuel injection timing will change	Nozzle operation will be unaffected	Fuel will leak into the drain line	Fuel will not be delivered	
14	1683	B	One simple laboratory analysis of used lube oil that can be carried out aboard ship is called the _____.	paraffin test	blotter test	stability test	spectrographic test	
14	1684	A	Which of the turbocharging methods listed directs the exhaust gases to the turbine at fairly uniform velocity and pressure?	Constant pressure	Pulse pressure	Constant velocity	Axial flow	
14	1685	A	The lower water seal on a diesel engine wet cylinder liner must allow for liner expansion and contraction. This seal is most commonly a _____.	neoprene O-ring	soft copper gasket	precision ground flange joint	flexible metallic seal ring	
14	1686	C	The illustrated starting motor disengages the drive/clutch mechanism after the engine has started due to _____.	de-energizing the solenoid	the potential retraction energy possessed by the return spring "D"	the mechanical interaction between the clutch and the splined sleeve	centripital force exerted by the rotating armature	See illustration number(s): MO-0051
14	1687	C	A bendix drive starting motor disengages the drive gear from the flywheel by _____.	spring force	rotating of the starting cam	the high rotating speed of the flywheel	applying accumulator pressure	
14	1688	C	In a diesel engine, pistons are attached to the crankshaft by _____.	push rods	piston rods	connecting rods	piston guides	
14	1689	D	The component identified as item #9 is used as part of the _____.	fuel injection metering system	fuel pressure delivery system	cylinder lubricating system	safety shut down system	See illustration number(s): MO-0016
14	1690	B	The illustrated cylinder lubricator quill check valve can be inspected without draining the cylinder cooling water jacket by _____.	unbolting and removing the cover, item #14	unscrewing and removing item #6 from the cylinder	unscrewing and removing item #4	inspection can not be done without first draining the jacket cooling water	See illustration number(s): MO-0042
14	1691	C	It is easier to replace a dry cylinder liner than a wet one because _____.	of the thin wall thickness	honing makes it easier to maintain the desired oil film	water seals are not required	it fits more loosely due to a decrease in heat transfer through the composite wall	
14	1692	C	If the needle valve in a fuel injection nozzle sticks open, _____.	fuel will leak into the nozzle drain line	no fuel will be delivered through the nozzle	the nozzle will overheat	injection lag will be increased	
14	1693	A	Which of the listed conditions can be used to determine if lube oil has been diluted by fuel?	Viscosity is lowered.	Octane number is altered.	Pump speed is decreased.	Blowers' speed is decreased.	
14	1694	D	Intake air flow from a diesel engine turbocharger is directly proportional to engine _____.	exhaust gas pressure	exhaust gas temperature	speed	load	
14	1695	B	The device shown in the illustration is closed by force as provided by _____.	"E"	"F"	"H"	"J"	See illustration number(s): MO-0066
14	1696	C	Which instrument is used to take crankshaft deflection readings?	feeler gage	Outside micrometer	Strain gage	Gage block	
14	1697	C	Which instrument is used to take crankshaft deflection readings?	feeler gage	Outside micrometer	Strain gage	Gage block	
14	1701	D	One advantage of dry cylinder liners used in a diesel engine is the _____.	lower thermal expansion rates than wet liners	greater heat transfer rate than wet liners	greater wear resistance than wet liners	procedure to replace dry liners is simpler than for wet liners	
14	1703	C	The purpose of an interference angle in a diesel engine exhaust valve is to _____. I. seat the valve quickly II. break up seat deposits	I only	II only	both I and II	neither I nor II	
14	1704	D	One characteristic of a pulse type turbocharging system is _____.	high average exhaust manifold pressure	greatly fluctuating inlet manifold pressure	constant exhaust manifold pressure	multiple exhaust pipes to the turbocharger	

14	1705	A	The purpose of the delivery check valve used in a diesel fuel injection jerk pump is to _____. I. assist in a quick cutoff of fuel injection II. prevent fuel oil backflow from the injection pump	I only	II only	both I and II	neither I nor II	
14	1706	D	In the illustrated engine, the fuel camshaft gear drive housing is letter _____.	C	D	E	F	See illustration number(s): MO-0003
14	1707	B	In the large slow-speed main propulsion diesel engine shown in the illustration, the part labeled "G" is the _____.	lube oil pump	fuel oil pump	jacket water pump	crankcase exhaust fan	See illustration number(s): MO-0003
14	1708	C	To guarantee that a reduction gear bearing is receiving proper oil supply, you should check the _____.	lube oil pressure to the bearing	lube oil strainer magnets	bearing lube oil temperature	lube oil temperature at the cooler outlet	
14	1709	B	If govenor Item #19 were to break on a main propulsion diesel engine operating under full load, the engine RPM will _____.	remain the same until mannually changed	decrease to a slightly lower value	hunt until stabilized by the droop rod	increase until the overspeed trip actuates	See illustration number(s): MO-0095
14	1710	B	If governor Item #10 in the illustration were to break on a main propulsion diesel engine operating under full load, the engine RPM will _____.	remain the same until the over speed trip actuated	decrease to a slightly lower value	hunt until stablized by droop rod	increase until the overspeed trip actuated	See illustration number(s): MO-0094
14	1711	C	One of the advantages in the use of a dry liner over a wet liner is _____.	it is fitted with neoprene O-ring seals	the honing process makes it easier to maintain the desired oil film	there is less likelihood of water leaking into the combustion space	it fits more loosely due to a decrease in heat transfer through the composite wall	
14	1712	D	Heat damage to fuel injection nozzles on small high-speed diesel engines, can be prevented by _____.	employing fuel oil as a cooling medium	preventing hard carbon deposit on nozzle tips	avoiding fuel oil temperature exceeding builder's specification	ensuring good metallic contact between nozzles and cylinder heads	
14	1713	B	When accumulated carbon at the air inlet ports of a two-stroke/cycle diesel engine is being removed, you should take care to avoid carbon particals _____.	entering the lube oil	entering the cylinder	entering the water jacket	becoming lodged under the intake valves	
14	1714	B	Which of the following turbocharging systems channels the exhaust gases of each individual cylinder directly into the turbine rotor blades?	Reaction	Pulse	Constant Pressure	Variable pressure	
14	1715	B	The purpose of an interference angle in a diesel engine exhaust valve is to _____. I. work in conjunction with valve rotators to rotate the valve II. seat the valve quickly	I only	II only	both I and II	neither I nor II	
14	1716	A	The device most commonly used to measure exhaust gas temperature of cyclinders is a _____.	pyrometer	calorimeter	dynamometer	tachometer	
14	1717	D	By comparing the exhaust gas output of each cylinder of a diesel engine, one method of determining if the engine load is balanced is by the use of a _____.	tachometer	calorimeter	pedometer	pyrometer	
14	1718	B	By comparing the exhaust gas temperature of each cylinder, the operator can determine if the load is balanced throughout the engine. The device most commonly used is a _____.	tachometer	pyrometer	dynamometer	calorimeter	
14	1719	D	By comparing the exhaust gas output of each cylinder of a diesel engine, one method of determining if the engine load is balanced is by the use of a _____.	dynamometer	calorimeter	pedometer	pyrometer	
14	1720	C	The principal purpose of refractory and insulation installed in the firebox of an auxiliary boiler is to _____.	prevent flame impingement on the generating tube bank	direct the force draft into the space between the inner and outer casings, to maintain a pressure seal	protect the inner casing and reduce heat loss	prevent slag accumulation on the corbels	

14	1721	A	Which of the following statements is true concerning the diesel engine cylinder head and valve mechanism shown in the illustration?	The valve stem guides are cooled by heat conducted by the jacket cooling water.	Oil is prevented from leaking out of the valve cover by a metal to metal fit.	The illustrated engine utilizes a dry type cylinder liner.	Valve clearance is adjusted at point #1.	See illustration number(s): MO-0013
14	1722	D	The major cause of problems occurring with fuel injection equipment is _____.	incorrect replacement of barrels and plungers of jerk pumps	overheating of the nozzle orifices	cracked pump housings	dirt in the fuel	
14	1723	C	Why should the main steam stop valve of an auxiliary boiler be eased off its seat and then gently closed before lighting off?	To examine the valve stem for scars or nicks.	To check for a tight bonnet seal.	To ensure that the valve will not be seized shut when hot.	To check the valve packing.	
14	1724	A	Which of the listed types of superchargers will NOT have a volumetric capacity proportional to engine speed?	Exhaust gas turbocharger	Roots blower	Piston type blower	Vane type blower	
14	1725	C	According to Coast Guard Regulations (46 CFR), the highest boiler pressure where a tubular type gage glass may be installed is _____.	100 psig	200 psig	250 psig	300 psig	
14	1726	B	Before any work is to be carried out on a burner in an automatically fired auxiliary boiler, you should always _____.	allow the boiler to cool completely	close all manually operated fuel valves	lock all safety interlock switches closed	block all control system relays closed	
14	1727	B	When an additional load is applied to a diesel engine which is using an inadequately inflated air bladder clutch unit, you can expect _____.	pneumatic seizure	overheating because of slipping shoes	chipped reduction gear teeth	excessive wear on the thrust bearings	
14	1728	D	When two medium speed diesel engines are electrically coupled in parallel to a common propeller shaft which will operate at a speed less than 100 RPM, which of the operating conditions listed will apply?	Propeller shock loads can severly damage the clutch.	One engine must be running ahead and the other astern.	Full reversing torque is not available.	Mechanical reduction gearing is required.	
14	1729	B	All oil-fired boilers, reguardless of intended mode of operation, with automatic safety control systems must automatically close the burner valve when_____.	flame in boiler furnace is confirmed	actuated by boiler safety trip	burner is properly seated	starting trial for ignition occurs	
14	1730	D	All oil-fired boilers, reguardless of intended mode of operation, with automatic safety control systems must automatically close the burner valve when_____.	flame in boiler furnace is confirmed	starting trial for ignition occurs	burner is properly seated	actuated by boiler safety trip	
14	1731	D	The device shown in the illustration is screwed directly into the cylinder head through an opening in the combustion space. The purpose of the device is to _____.	attach a special gauge to take firing and compression readings	remove moisture accumulation from the cylinder prior to starting	inject fuel oil into the cylinder	warn of excess combustion pressure in the cylinder	See illustration number(s): MO-0023
14	1732	D	A defective injector nozzle in a propulsion diesel engine can cause _____.	engine power losses	smoking due to unburned fuel	high exhaust temperature readings	all of the above	
14	1733	C	Lubricating oil viscosity in an operating diesel engine can be reduced by _____.	increasing cooling water flow	increasing lube oil flow	dilution by fuel oil	adding SAE 70 oil	
14	1734	D	Which of the following statements is correct regarding a turbocharged four-stroke/cycle diesel generator?	At zero load the intake manifold pressure is greater than the exhaust manifold pressure.	At full load the intake manifold pressure and exhaust manifold pressure are equal.	At full load the intake manifold pressure is less than the exhaust manifold pressure.	At full load the intake manifold pressure is greater than the exhaust manifold pressure.	
14	1735	A	In an actual installation, the flange identified by the letter "U", shown in the illustration, can be directly connected from the brine ejector discharge to the _____.	saltwater inlet at "I"	upper flash chamber labeled "F"	feed water return labeled "K"	second effect tube bundle	See illustration number(s): MO-0110
14	1736	C	Coast Guard Regulations (46 CFR) require electric hot water supply boilers to be provided with a/an _____.	audible high water level alarm	temperature limiting device set at 212° F	pressure relief valve set at the MAWP	automatic reset pressure limiter	

14	1737	C	Which of the listed effects would mixtures of ethylene glycol and phosphate compounds have on the metal surfaces of the cooling system of a diesel engine? I. Protects the coolant from freezing. II. Protects metallic surfaces from corrosion.	I	II	Both I and II	Neither I or II	
14	1738	A	Which of the listed effects would mixtures of ethylene glycol have on the cooling system of a diesel engine? I. Protects the coolant from freezing. II. Protects metallic surfaces from corrosion.	I	II	Both I and II	Neither I or II	
14	1739	B	Which of the listed effects would mixtures of phosphate compounds have on the metal surfaces of the cooling system of a diesel engine? I. Protects the coolant from freezing. II. Protects metallic surfaces from corrosion.	I	II	Both I and II	Neither I or II	
14	1741	B	Diesel engine cylinder head test cocks are used to _____.	check cylinder lubrication	connect the pressure indicator	pressure test cylinder heads	connect the exhaust gas pyrometers	
14	1742	C	Dirt lodged on the nozzle valve seat of a fuel injection nozzle will cause _____.	erosion and cratering of the nozzle orifices	fuel leakage into the nozzle drain line	fuel leakage before and after injection	insufficient fuel delivery through that nozzle	
14	1743	D	A sudden decrease in the diesel engine lube oil viscosity could be an indication of _____.	loss of additives from the lube oil	carbon deposits in the lube oil	excessive centrifuging	excessive fuel dilution	
14	1744	A	The relative air pressure in the inlet manifold of a turbocharged diesel engine is usually _____.	greater than the average exhaust manifold pressure	less than the average exhaust manifold pressure	greater at the turbine wheel than at the impeller	greater at reduced engine speed	
14	1751	D	Which of the listed cylinder head design features is shown in the illustration?	The valve cages are provided for the exhaust valves.	The engine is equipped with a dry liner.	A gastight seal is provided by a gasket between the cylinder head and cylinder liner.	The engine cylinder head is fitted with replaceable valve seats.	See illustration number(s): MO-0013
14	1752	D	A leaking diesel engine fuel injector will cause _____.	prolonged maintenance intervals	improved atomization	greater fuel economy	incomplete combustion	
14	1754	B	A turbocharged diesel engine will have an intake manifold pressure _____.	constantly decreasing as engine load increases	constantly increasing as the amount of supercharging increases	approximately equal to exhaust manifold pressure at all times	approximately equal to atmospheric pressure at all times	
14	1761	D	Diesel engine cylinder head test cocks are used to _____.	check cylinder lubrication prior to starting engine	connect exhaust gas analyzers to determine engine efficiency	pressure test cylinder heads to check for leaks	remove moisture accumulations from cylinders prior to starting	
14	1762	B	Problems with the diesel engine fuel injection pump are usually caused by _____.	improper adjustment	contaminated fuel	kinked fuel lines	excessive engine vibration	
14	1763	B	Which of the following faults would allow lube oil to enter the cooling system of a diesel engine?	Excessive valve train lubrication	Leaking standby oil cooler core	Excessive lube oil pressure	Excessive lube oil in the system	
14	1764	D	What method is used to supply air to the cylinders of the diesel engine shown in the illustration?	By the action of the turbocharger at full load.	By the action of an auxiliary electric blower at low load.	By the pumping action of the piston.	All of the above.	See illustration number(s): MO-0003
14	1771	B	When turning a new cylinder head stud on a lathe, the minimum effective thread length of the stud is determined primarily by the _____.	stud length	stud diameter	head nut diameter	stud material	
14	1772	B	Which of the following problems is the main source of fuel pump and injection system malfunctions?	Improper lubrication	Air in the fuel system	Coated fuel lines	Excessive vibration	
14	1773	C	Lube oil in the fresh water cooling system of a diesel engine may result from a _____.	camshaft seizure	lube oil pump failure	lube oil cooler failure	lube oil sump overflow	
14	1774	C	Which of the diesel engine components listed increases air density and helps to improve engine operating efficiency?	Impeller	Compressor	Aftercooler	Exhaust diffuser	

14	1775	A	Differential type fuel oil nozzles in a diesel engine are closed directly by _____. I. spring pressure II. fuel oil pressure	I only	II only	either I or II	neither I nor II	
14	1776	D	Fuel oil strainers should be made of _____. I. copper II. brass	I only	II only	either I or II	neither I nor II	
14	1781	B	One end of a cylinder for a medium or high-speed diesel engine is sealed by the piston and rings, the other end is sealed by the _____.	crankcase	cylinder head	valve cover	engine frame	
14	1782	D	High cylinder firing pressure, accompanied by low exhaust temperature, can result from _____.	improper fuel rack positioning	lengthy exhaust valve duration	extended operation at light load	excessively early injection timing	
14	1783	D	Which harmful consequence may be the result of lube oil sludge accumulation?	Clogged oil pump suction screens.	Increased oil operating temperatures.	Sticking piston rings.	All of the above	
14	1784	D	What is the function of the aftercoolers installed in the diesel engine air intake system?	Decrease the air density	Increase the exhaust temperature	Decrease the lube oil temperature	Increase the air density	
14	1791	D	An efficient seal between the cylinder block and cylinder heads on many diesel engines is obtained with _____.	graphite packing	sealing compound	lubricating oil	gaskets	
14	1792	C	An increase in the fuel injection pump discharge pressure can be caused by a/an _____.	leaking delivery valve	increase in engine load	plugged injector spray hole	increased plunger stroke	
14	1793	D	High lube oil temperatures developing in a diesel engine can result from _____.	high oil pressure	excessive bearing end play	plugged oil control rings	engine overload	
14	1794	A	The function of the aftercooler installed between the turbocharger and intake manifold on some diesel engines, is to _____.	increase the density of the intake air	decrease turbocharger power usage	reduce exhaust gas temperature	compensate for turbocharger RPM fluctuations	
14	1795	B	A dirty fuel oil filter is can be detected by _____. I. fuel oil analysis II. observing the pressure drop across the filter	I only	II only	either I or II	neither I nor II	
14	1801	B	Which of the terms listed below represents the operational speed at which excessive engine vibration is created?	Non-harmonic speed.	Critical speed.	Maximum speed.	Design maximum speed.	
14	1803	D	Lubricating oil used in a diesel engine serves to _____.	reduce the wear of bearing surfaces	cool the bearing surfaces	assist in sealing bearing surfaces	all of the above	
14	1804	C	Aftercooling of a turbocharged diesel engine will result in _____.	higher torque but lower brake horsepower	lower torque but higher brake horsepower	higher torque and higher brake horsepower	lower torque and lower brake horsepower	
14	1811	D	Vibrations from diesel engines and engine driven equipment are isolated from the hull structure by _____.	torsional-vibration dampers	harmonic balancers	a detuner flywheel	flexible engine mountings	
14	1812	C	Which of the conditions listed would cause simultaneous high cylinder firing pressure and low exhaust temperature?	Improper fuel rack positioning.	Lengthy opening of the exhaust valve.	Excessively early injection timing.	Extended light load operation.	
14	1813	C	One function of diesel engine lubricating oil is to _____.	induce carbon formation on cylinder walls	improve fuel penetration in the combustion space	form a friction reducing film between mating surfaces	lubricate the fuel injectors	
14	1814	A	When used in conjunction with a turbocharger, the main function of an aftercooler is to _____.	increase the density of the cylinder air charge	prevent turbocharger overheating	eliminate the need for a precooler	remove moisture from air compressed by the turbocharger	
14	1821	B	Which of the devices listed is installed on a diesel engine to isolate some of the crankshaft vibrations caused by rotational and reciprocating forces?	Planetary gear set	Torsional vibration damper	Friction clutch	Air bladder clutch	
14	1822	C	When fuel is injected too early in the injection cycle, it may cause the engine to have _____.	high fuel economy	smoky exhaust	early detonation and a loss of power	high exhaust temperatures	
14	1824	C	Performance of a turbocharged engine can be improved by _____.	decreasing the amount of valve overlap	preheating the air intake	aftercooling the intake air	preheating light fuels	

14	1831	B	Critical speeds occurring within the operating speed range of a main propulsion diesel engine may be changed, or have their damaging effects reduced by a/an _____.	engine support vibration isolator	detuner or viscous fluid damper	lightened crankshaft flywheel	spherically seated crankshaft bearing	
14	1832	A	Early fuel injection timing is indicated by the cylinder pressure being _____.	above normal with a below normal exhaust temperature	above normal with a normal exhaust temperature	below normal with a normal exhaust temperature	below normal with an above normal exhaust temperature	
14	1833	D	In a diesel engine, the function of lubrication oil is to provide _____.	a film between the shafts and bearings	cooling of the pistons and bearings	for removal of dirt or metal particles resulting from wear	all of the above	
14	1834	C	The purpose of an aftercooler is to _____.	reduce the turbocharger operating temperature	increase the pressure of the inlet air	increase the density of the inlet air	reduce the blower operating temperature	
14	1841	B	In the pressure-volume diagram shown in the illustration, curve "A-d" indicates _____.	fuel injection after dribble	combustion at approximately constant pressure	opening of exhaust valves	start of fuel injection	See illustration number(s): MO-0035
14	1842	A	When fuel is injected in a diesel engine cylinder too early, _____.	ignition may be delayed	fuel economy is not affected	exhaust gas temperature will be unchanged	the exhaust will be clear	
14	1844	A	The aftercooler inlet should be connected to the turbocharger illustrated at the part labeled _____.	B	C	H	K	See illustration number(s): MO-0080
14	1845	D	When fuel oil is accidentally mixed with lube oil which of the following processes can be used to separate them? I. filtering II. settling	I only	II only	either I or II	neither I nor II	
14	1851	C	Between the periods of injection and ignition of the fuel, a diesel engine crankshaft rotates through the _____.	detonation period	firing period	delay period	advance period	
14	1852	B	Which of the listed set of conditions indicates early fuel injection timing?	Loss of engine power and high exhaust temperatures	Higher than normal firing pressure and low exhaust temperature	High fuel consumption and high exhaust temperatures	Lower than normal compression pressure and high exhaust temperature	
14	1861	A	The power/expansion stroke shown in the illustration is indicated by the diagram numbers _____.	1 through 3	4 through 6	1 through 4	3 through 6	See illustration number(s): MO-0025
14	1862	B	If fuel injection in a diesel engine begins earlier than the design start of injection, ignition may be delayed because the _____.	fuel oil injection pressure may not be high enough	cylinder compression pressure may not be high enough	cylinder compression temperature may be too high	scavenge and purge process is incomplete	
14	1863	A	A diesel engine exposed to widely varying ambient temperatures should use a lubricating oil with _____.	a high viscosity index	a low viscosity index	extreme pressure additives	no additives	
14	1864	C	The air supplied to the cylinders by a turbocharger is often reduced in volume by a/an _____.	air compressor	diffuser	aftercooler	venturi	
14	1871	C	Which of the following processes is indicated by the flow arrows shown in the illustration?	Return air flow during start-up upon achieving ignition.	Return flow of excess fuel oil from the injector.	Relief of excessively high pressure gases from the cylinder.	Cooling water bypass flow to the heat sink.	See illustration number(s): MO-0026
14	1872	B	A diesel engine will lose power if fuel injection occurs too early because the _____.	fuel will not be properly atomized in the cylinder	ignition will be delayed due to low ignition temperature	maximum fuel expansion will occur on the compression stroke	fuel will ignite before top dead center	
14	1874	C	Which of the engine components listed increases air charge density and helps to improve engine operating efficiency?	Intake manifold	Water-cooled exhaust system	Aftercooler	Exhaust diffuser	
14	1875	C	In a diesel engine, exhaust valves open before the intake ports are uncovered to _____. I. reduce pumping losses II. reduce back pressure	I only	II only	both I and II	neither I nor II	

14	1881	C	Modern marine diesel engines equipped with mechanical fuel injection operate on a combustion cycle which is _____.	entirely constant pressure	entirely constant volume	a combination of constant volume and constant pressure	a combination of constant temperature and constant pressure	
14	1882	B	A fuel injection valve opening at a pressure lower than normal will result in _____.	late fuel injection	early fuel injection	high exhaust temperature from that cylinder	decreased effective stroke from that injector	
14	1891	B	In the large, slow-speed, main propulsion diesel engine shown in the illustration, the upward motion of the piston draws scavenging air through _____.	venturi tubes	nonreturn valves	an auxiliary cold start heater core	the component labeled "U"	See illustration number(s): MO-0003
14	1892	C	When high firing pressures and low exhaust temperatures occur simultaneously in a diesel engine, this may be a result of _____.	decreased piston-to-cylinder head clearance	increased exhaust back pressure	early timing of fuel injection	low scavenge air temperature	
14	1901	D	In a four-stroke/cycle diesel engine, after the completion of the power stroke, the piston will move _____.	up and draw in a fresh air charge	down to burn off fuel	down to compress the fuel air charge	up and force out the exhaust gases	
14	1902	B	If fuel injection occurs too early, a diesel engine will lose power because the _____.	fuel will not be properly atomized in the cylinder	ignition will be delayed due to low compression pressure	maximum fuel expansion will occur on the compression stroke	fuel will ignite after top dead center	
14	1903	B	A large, low-speed, crosshead, main propulsion diesel engine using residual fuel oils must have a cylinder oil having a _____.	low TBN value	high alkaline reserve	low flash point	high pour point	
14	1904	B	Which of the conditions listed will occur as a result of having an intercooler installed in the diesel engine intake system shown in the illustration?	Intake valve burning is eliminated.	Air charge density will be increased.	Brake specific fuel consumption will be increased.	Cylinder combustion temperatures will be lowered.	See illustration number(s): MO-0081
14	1911	C	For a four-stroke/cycle medium-speed diesel engine, fuel injection commences from 7 to 26 crankshaft degrees before top dead center. After fuel injection commences, how many degrees does the camshaft rotate before the exhaust valve push rod moves up?	21,-31,	45,-55,	66,-76,	106,-115,	
14	1912	D	Due to excessive water in the fuel, a diesel engine fails to start. Before the engine can be started, the water must be removed from the _____.	fuel pumps	cylinders	fuel strainers	all of the above	
14	1913	D	A diesel engine should use which type of lubricating oil?	Nondetergent oil	Cutting oil	High grade vegetable oil	Detergent oil	
14	1914	B	The diesel engine shown in the illustration, is provided with an auxiliary blower to _____.	increase scavenge air pressure at full load	provide scavenge air pressure at low load	maintain a vacuum on the crankcase	maintain a positive pressure on the crankcase	See illustration number(s): MO-0003
14	1921	A	During the diesel engine power stroke, the side thrust of a trunk type piston is a result of the angle _____.	formed by the connecting rod and cylinder center line	of the bevel on the piston oil control rings	formed by the crank arm and crank pin	formed by the master and link connecting rods	
14	1922	A	A diesel engine fails to start due to excessive water in the fuel. Before the engine can be started, the water should be removed from the _____.	fuel lines	lube oil filter	crank case pump	rocker arm reservoir	
14	1924	B	Which of the designs listed will keep the lobes from making contact in a Roots-type blower?	Drive chain	Blower timing gears	Air trapped between blower lobes	Oil filter between blower lobes	
14	1932	A	Faulty operation of diesel engine fuel injection nozzles can be directly caused by _____.	water in the fuel oil supply	excessive fuel nozzle holder cooling	a distorted fuel spray pattern	leakage past the plunger into the oil drain	
14	1933	D	The thickness of the oil film to be developed in a diesel engine main bearing, depends upon the _____.	bearing pressure	viscosity of the oil	rpm of the shaft	all of the above	

14	1934	A	Which of the Roots blower rotors listed below, will supply air to a two-stroke/cycle, medium-speed, diesel engine with the least amount of turbulence and pulsation?	Three-helical lobes	Two-helical lobes	Three-cylindrical lobes	Two-cylindrical lobes	
14	1941	B	The side pressure per unit of area, resulting from the angularity of the motion of the connecting rod, depends primarily on the _____.	weight of the piston	length of the piston	length of the cylinder liner	speed of the engine	
14	1942	B	A diesel engine fails to start because of water in the fuel. In order to start the engine, you should _____.	turn engine with jacking gear	drain filters and strainers and bleed off water at each injection pump	use ether to start the engine with blowdown valves open	blow through the cylinders and fuel lines with a drying agent	
14	1943	A	The highest indicated lube oil pressure in a diesel engine should be expected when the engine oil is _____.	cold at idle	warm at idle	warm at full speed	warm at full speed and no fuel dilution exists	
14	1951	B	In a single acting, four-stroke/cycle diesel engine, the power impulse in an individual cylinder occurs _____.	once every crankshaft revolution	once every two crankshaft revolutions	once every piston stroke	twice every piston stroke	
14	1952	A	Water in the fuel can prevent the engine from starting, prevent it from developing full power, or _____.	run at an irregular speed	create high lube oil temperature	cause the engine to overspeed	cause blue smoke in the exhaust	
14	1954	D	The lobes of a Roots-type blower are sometimes twisted into a spiral formed around the axes of rotation to _____.	decrease air losses around the lobes	decrease maintenance	allow for higher blower operating speeds	produce a more constant airflow	
14	1961	D	The most rapid period of fuel combustion occurring in a diesel cylinder should begin just before the piston reaches top dead center and _____.	when fuel injection has been completed	when fuel vaporization has been completed	should continue through the afterburning period	should be completed after top dead center	
14	1962	D	Permitting a diesel engine fuel oil day tank to run dry can cause _____.	overheated injection pumps	water condensation in the cylinders	fuel dilution of the lube oil	air in the fuel system	
14	1963	A	The purpose of an oil mist detector in a main propulsion diesel engine is to warn of _____.	excessive mist density in the crankcase	excessively high crankcase vacuum	excessively high bearing temperatures	excessive carbon buildup in the lube oil	
14	1964	C	Most Roots-type blowers have two rotors which _____.	are extremely quiet at high speed	rotate in the same direction	rotate in opposite directions	decrease objectionable turbulence in the cylinders	
14	1971	B	As engine RPM is increased from idle speed to full load speed, which of the conditions listed will decrease?	Compression ratio	Fuel/Air ratio	Compression pressure	Lube oil pressure	
14	1972	D	If a diesel engine runs out of fuel, you can expect trouble from _____.	overheated injector pumps	water condensed in the cylinders	fuel dilution of the lube oil	air in the fuel system	
14	1974	A	Some diesel engines are equipped with a Roots-type blower to provide _____.	more air to combine with the fuel	more amps per kilowatt hour	higher no-load RPMs	higher voltage output	
14	1981	A	The pressure in an operating diesel engine cylinder continues to rise for a short period after the piston passes top dead center as a result of the _____.	expansion of the combustion gases	exhaust and intake valves just closing	maximum compression pressure is just being attained	fuel injection occurring at that point and combustion begins	
14	1982	C	Air in the fuel lines to the fuel injection nozzles of a diesel engine will cause the engine to _____.	burn excessive amounts of lube oil	overheat without smoking	operate with reduced power or stop	run away without load	
14	1983	C	The TBN value of diesel engine lube oil refers to its ability to _____.	resist changes in viscosity with changes in temperature	resist emulsification	neutralize acids	resist oxidation at high temperatures	
14	1984	D	Regarding the positive displacement rotary blower shown in the illustration, air compression takes place _____.	between the rotating blower lobes	between the casing and blower lobes	after the engine reaches operating speed	as air moves into the discharge passage	See illustration number(s): MO-0082

14	1991	B	Prior to starting, the purpose of turning over a main propulsion diesel engine with the cylinder test cocks open, is to _____.	test the starting system	remove condensation from the cylinders	check the compression	check for proper lube oil pressure	
14	1992	A	Air in the fuel lines of a diesel engine can cause _____.	ignition failure	oxygen corrosion of the fuel lines	the pistons to seize	blue smoke	
14	1993	B	Which of the following characteristics of lube oil helps to reduce the amount of deposits in the piston ring belt during the combustion process in a diesel engine?	Low viscosity index	Low carbon forming tendencies	High film strength	High noncorrosive qualities	
14	1994	B	Which of the following terms best describes the Roots-type blower used to supercharge a diesel engine?	Rotary vane	Positive displacement	Axial flow	Centrifugal	
14	2001	D	Starting a large propulsion diesel engine using diesel fuel during cold weather conditions can be made easier by _____.	increasing the quantity of starting air	increasing the lube oil pressure	heating the engine fuel supply	heating the engine jacket water	
14	2002	D	If you suspect a diesel engine is misfiring due to air leakage into the fuel system, you should begin looking for the leak at the _____.	fuel line connections to the cylinder injection valves	gasket surfaces of the fuel oil filters	discharge fittings of the fuel injector pumps	suction side of the fuel oil transfer pump	
14	2003	D	The color of the diesel engine detergent type lube oil in an operating diesel engine is black, this indicates _____.	"worn out" oil	fuel dilution	water dilution	normal oil condition	
14	2004	A	In a diesel engine, a positive displacement type blower is usually _____.	gear driven by the engine	driven by an exhaust gas turbine	driven by a camshaft	driven by separate motor	
14	2005	C	Which lubricating oil additive is used in diesel engines to reduce the tendency for sludge and varnish to form on the engine parts?	Flash point improvers	Pour point improvers	Inhibitors	Foam suppressors	
14	2011	D	Which of the following statements represents the reason for rolling over a diesel engine with the cylinder indicator cocks open prior to starting?	To test the starting system.	To remove air bubbles from the jacket water.	To ensure that the lube oil system delivers pressure.	To ensure foreign material (water etc.) is not present in the cylinders.	
14	2012	C	A diesel engine is turned at normal cranking speed, but fails to fire. This can occur from _____.	low lube oil temperature	low starting air temperature	air in the fuel injection system	water in the starting air system	
14	2020	D	Sludge formation in a diesel engine lube oil system is caused by _____.	carbonization of oils from the combustion chambers	emulsions of lube oil and water	coagulation of unburned fuel below the piston rings	All of the above.	
14	2021	B	Before starting a diesel engine, you should always _____.	check the pyrometer readings	check the crankcase oil level	change the fuel oil strainers	clean the air filter	
14	2022	D	If the low level alarm of the diesel fuel day tank fails to function, you can expect trouble from _____.	overheated injection pumps	water condensed in the cylinders	fuel dilution of the lube oil	air in the fuel system	
14	2023	A	Proper lubrication of the main bearings is more easily obtained in a single acting, four-stroke/cycle diesel engine than in a two-stroke/cycle diesel engine because _____.	the direction of pressure on the journals in four-stroke engines is continuously reversing, whereas in two-stroke engines it is constant	positive feed lubricators are installed on all bearings of four-stroke engines, whereas as a splash feed system is used on two-stroke engines	four-stroke engines usually utilize a heavier grade of fuel oil than two-stroke engines	two-stroke engines usually consume less lube oil than four-stroke engines	
14	2024	A	An aftercooler installed between the turbocharger and the cylinder air inlet _____.	increases the density of the air	decreases the density of the air	increases the specific heat of the air	decreases the specific heat of the exhaust	
14	2031	C	Which of the following should always be checked prior to starting a diesel engine?	Air filters	Fuel oil strainers	Crank case oil level	Pyrometer readings	
14	2032	B	Air may be bled from the fuel system by _____.	blowing down the air tanks	loosening the compression nuts at the injectors	changing fuel filters	pumping down the day tanks	

14	2033	B	The amount of fuel injected into a diesel engine cylinder by a unit injector, is controlled by _____.	the firing pressure in the cylinder	a metering helix inside the pump	varying the physical length of the plunger stroke	varying the clearance between the injector cam and the injector rocker arm	
14	2034	B	If cooling water flow through the aftercooler is interrupted, the power output of a turbocharged diesel engine will drop because the _____.	turbocharger will stall	density of the air charge will decrease	scavenge effect will increase	exhaust pressure will increase	
14	2041	D	Prior to starting most medium-speed propulsion diesel engines, which of the procedures listed should be observed?	The expansion tank should be topped off.	The thermostatic water regulating valves should be manually opened.	The fuel filters should be changed.	The engine should be turned over slowly with the indicator cocks open.	
14	2042	D	If you determine that entrained air in the fuel oil system is causing a diesel engine to stall, you should first check for _____.	fuel leakage in the injector pump's discharge lines	worn gaskets in the transfer pump discharge lines	partially clogged fuel oil discharge strainers	loose fittings in the booster fuel pump suction piping	
14	2044	B	Which of the following procedures should be carried out to permit the use of a crosshead engine with an inoperable aftercooler?	Bypass the aftercooler to operate at sea speed.	Run at reduced speed until the cooler can be repaired or renewed.	Switch to diesel fuel and run at full speed.	Nothing needs to be done due to the low heating value of heavy fuel.	
14	2051	D	In the starting process of a diesel engine, the main object is to attain the compression conditions sufficient to _____.	turn the flywheel	reduce friction	overcome inertia	ignite the fuel	
14	2054	D	An increase in the load on a turbocharged diesel engine operating at constant speed will result in an increase in _____.	exhaust temperature	air box pressure	brake mean effective pressure	all of the above	
14	2061	B	When attempting to restart a warm high-speed engine, which of the following reactions can you expect?	Excessive fuel use	Higher than normal temperatures for start up	Longer starting periods	Higher than normal lube oil pressure	
14	2064	C	The high air velocity leaving the compressor of an exhaust gas turbocharger is converted to pressure in the _____.	inlet nozzle ring	turbine wheel blading	diffuser passages	inlet volute	
14	2070	C	Your vessel is about to begin maneuvering, in order to carry out easy restarting of a large heavy fuel diesel engine that has been stopped for some time, you should have _____.	used a higher than normal cranking speed	shifted to a fuel having a lower cetane number	shifted to a fuel having a higher cetane number	introduced supercharged air into the starting air system	
14	2071	D	Which of the following conditions would cause carbon deposits to form in the piston ring belt of a diesel engine?	Faulty combustion	Excessive ring temperature	Over lubrication	All of the above	
14	2072	C	Air in the fuel lines to the fuel injection nozzles of a diesel engine will result in _____.	lower compression pressures	overheating without smoking	failure to start	a run away without load	
14	2074	C	Which of the operating characteristics listed is correct concerning the blower shown in the illustration?	Each set of lobes is independently driven assuring proper timing.	Compression of the air is accomplished in the rotor housing.	Air delivery is approximately proportional to engine speed.	Air delivery is inversely proportional to engine speed.	See illustration number(s): MO-0082
14	2081	C	Which of the following operating procedures should be carried out immediately after any diesel engine is started?	Take all exhaust temperature readings.	Check the sump oil level.	Verify proper lube oil pressure.	Check the water level in expansion tank	
14	2082	C	Air in the fuel can cause _____.	high lube oil temperature	blue smoke	the engine to stop	piston seizure	
14	2091	D	If a diesel engine starts firing, but is unable to come up to normal speed, either without load or even under a small load, the cause may be _____.	insufficient fuel supply	faulty governor	high exhaust back pressure	all of the above may cause this problem	
14	2092	B	After changing out the fuel filters the diesel engine fails to restart. The most probable cause for this condition is a/an _____.	low compression	air-bound fuel system	improper spark	change in viscosity	

14	2094	A	When the load is increased on a turbocharged diesel engine, the amount of increased air supplied by the turbocharger will _____.	lag behind the increased fuel supplied to the engine	enter the engine along with the increase in fuel	enter the engine before the increased fuel supply	leave the turbocharger as a negative pulse	
14	2101	B	After starting a diesel engine, which of the listed operating conditions should be checked FIRST?	Air box pressure	Lube oil pressure	Exhaust temperatures	Raw water pressure	
14	2102	B	Faulty operation of diesel engine fuel injection nozzles can be a direct cause of _____.	excessive fuel nozzle holder cooling	sediment in the fuel supply	distortion of the fuel spray pattern	improper atomization of the fuel	
14	2104	D	In a turbocharger, inlet air velocity is increased in the _____.	inlet nozzle ring	stationary diffuser passages	compressor outlet volute	rotating impeller vanes	
14	2111	B	While underway, which of the following would be the FIRST step in reversing a direct reversing large, low-speed, main propulsion, diesel engine?	Manually trip the overspeed device.	Interrupt the fuel flow to the engine.	Disengage the safety interlock.	Slide the camshaft to the neutral position.	
14	2112	D	Dirt in a fuel oil system of a diesel engine can cause _____.	damage to strainers	overspeeding of the engine	excessive cooling of the engine	injector damage	
14	2114	D	The power developed by a large slow-speed main propulsion diesel engine is dependent upon the _____.	quantity of air it takes in and retains in the cylinders during a given time period	proportion of trapped air that is utilized in the combustion process	thermodynamic efficiency of the engine cycle	all of the above	
14	2121	B	During maneuvering operations for a direct reversing large, low-speed, main propulsion diesel engine, which of the following actions is used to stop the shaft from turning prior to reversing the engine rotation?	Flywheel inertia	Admission of starting air	The way of the vessel	Securing of fuel to the cylinders	
14	2122	B	The most common diesel engine fuel system problems are caused by _____.	incorrect adjustments	dirty fuel	broken fuel lines	excessive vibration	
14	2124	C	When a diesel engine is operated at partial load, as compared to full load, a decrease will occur in the average _____.	air quantity aspirated	fuel injection pressure	combustion pressure on the power stroke	compression pressure on the compression stroke	
14	2131	D	A ship is propelled by a direct reversing large, slow-speed, diesel engine. One step in reversing the direction of propeller rotation for this vessel is by _____.	properly inflating the air operated clutch	reversing the reduction gears	changing the gear ratio	reversing the servomotor	
14	2132	B	Diesel engine fuel oil contamination often results in _____.	governor malfunctions	fuel injection system malfunctions	high cylinder lube oil temperatures	low intake temperatures	
14	2141	D	A diesel engine should not be operated at low loads for long periods of time because _____.	heavy carbon deposits will buildup on the valves and in the exhaust	fuel dilution is increased at low load	exhaust valves may be damaged	all of the above	
14	2142	B	The major cause of fuel pump and injection system problems is _____.	improper adjustments	contaminated fuel	kinked fuel lines	excessive engine vibration	
14	2152	B	A dirty fuel oil filter element can be detected by _____.	visual inspection of the element	the pressure drop across the filter	high fuel oil tank temperature	increase flow rate from the filter	
14	2154	C	Cylinder scavenging in a turbocharged, four-stroke/cycle, single acting, diesel engine is accomplished _____.	without cooling the pistons or cylinders	at a pressure below atmospheric	during the valve overlap period	with only the exhaust valve open	
14	2161	D	Operating a propulsion diesel engine at less than 30% of designed normal load for prolonged periods will result in _____.	decreased fuel consumption per brake horsepower	more complete cylinder scavenging	extended valve life	carbon formation on combustion chamber surfaces	
14	2162	B	The main source of fuel pump and injection system malfunctions is _____.	improper adjustments	contaminated fuel	coated fuel lines	excessive vibration	
14	2164	A	Turbocharged four-stroke/cycle diesel engines utilize valve overlap for _____.	improving cylinder scavenging	preheating the combustion chamber	reducing air charge density	preventing valve wear	
14	2171	A	What harmful condition can result if a diesel engine is operated at very light loads for long periods of time?	Increased carbon buildup.	Burning of intake valves.	Excessive firing pressures.	Increased fuel consumption.	

14	2172	A	A faulty injector in one cylinder of an operating diesel engine can be located by _____.	cutting out individual injectors and noting engine performance	checking lube oil temperature	checking cam position	using a timing light	
14	2173	D	Early injection timing is indicated by _____.	high exhaust temperature and low firing pressure	high exhaust temperature and high firing pressure	low exhaust temperature and low firing pressure	low exhaust temperature and high firing pressure	
14	2174	A	In a turbocharged four-stroke/cycle diesel engine, the exhaust valve remains open until after top dead center and the intake valve opens before top dead center to _____.	produce a scavenging effect in the combustion space	equalize cylinder and exhaust manifold pressures	alleviate the difference in valve size between the intake and exhaust	flush out condensate that collects after each compression stroke	
14	2181	A	Operating a diesel engine under light loads and at low temperatures for an extended period can result in _____.	formation of carbon on the intake and exhaust ports	high water jacket temperatures	overheated pistons and cylinders	an increase in lube oil viscosity due to fuel dilution	
14	2191	D	While maneuvering, you discover heavy smoke coming from the turbocharger casing, you should _____.	check the air filter for dirt	check for an exhaust leak	check the cooling water temperature	notify the bridge that you are going to shut the engine down	
14	2192	C	A change in the quality of fuel atomization by a diesel engine fuel injector would be caused by a/an _____.	increase in engine speed	increase in cylinder turbulence	leaking needle valve	reduction in cylinder turbulence	
14	2194	D	A turbocharged, four-stroke/cycle diesel engine has a larger valve overlap than a naturally aspirated four-stroke/cycle diesel engine, in order to increase the _____.	temperature of the exhaust gases	energy supplied to the turbocharger	air pressure to the intake manifold	purge of exhausted gases from the cylinders	
14	2201	C	In the construction of a diesel engine, what is the purpose of end plates?	To provide accessibility to the cylinder liners.	To add stability to the engine block.	To add rigidity to the block and a surface for attaching other parts.	To make a surface for the base.	
14	2202	A	When fuel enters the crankcase of a diesel engine, it _____.	dilutes the lube oil and reduces its viscosity	forms sulfuric acid in the lube oil	causes pitting and failure of the bearings	causes sludge deposits on valve stems	
14	2204	C	The exhaust ports of a diesel engine using the crossflow scavenging method are opened and closed by the _____.	reciprocating motion of exhaust valves	rotary motion of the camshaft	reciprocating motion of the piston	developed differential	
14	2211	B	A large, low-speed, main propulsion diesel engine is operating at rated load and speed while the vessel is in calm seas. As the intensity of the seas increase, the engine speed governor maintains the same RPM, although the load indicator indicates an increase in load beyond its allowable limits. Which of the following actions should be taken?	Increase the load limit setting.	Decrease the load limit setting.	Increase engine RPM.	Ignore this situation as the engine can handle the load increase.	
14	2212	B	A change in the degree of fuel atomization in a diesel engine greatly affects the _____.	air turbulence	fuel penetration	fuel spray tip angle	fuel injection rate	
14	2214	A	In a Roots-type rotary blower, the volume of air delivered is directly proportional to _____.	engine speed	engine load	brake horsepower	brake specific fuel consumption	
14	2221	A	A safety cover differs from other diesel engine access doors in that it is fitted with a _____.	spring-loaded pressure plate	handwheel	nut-operated clamp	large gasket	
14	2222	C	The "breaking-up" of fuel as it enters a diesel engine cylinder is known as _____.	airification	vaporization	atomization	gasification	
14	2224	C	On a diesel engine equipped with a Roots-type blower, _____.	the turbine speed depends on engine load	the air is compressed in the air cleaner	the blower speed is proportional to the engine speed	the blower lobes are lubricated by the engine lube oil	
14	2231	C	If a two-stroke/cycle diesel engine is overspeeding due to leakage of lube oil into the cylinders, what should you do to stop the engine?	Move the fuel control mechanism to the no fuel position.	Block the fuel supply by closing the master fuel valve.	Shut off the fuel supply and block the flow of intake air.	Relieve all pressure in the fuel system.	

14	2232	B	Which of the following statements concerning fuel atomization in a diesel engine cylinder is correct?	The greater the atomization, the greater the penetration.	The greater the atomization, the lesser the penetration.	The degree of atomization has nothing to do with the degree of penetration.	Atomization and penetration are one and the same.	
14	2241	B	If a single cylinder relief valve on a main propulsion diesel engine begins to lift, but it is not possible to secure the engine, which of the following actions should be taken?	Increase the cooling water flow to the engine.	Secure or reduce fuel to that cylinder.	Screw down on the pressure adjusting spring to decrease popping pressure.	Readjust the injection timing.	
14	2242	C	The purpose of the interlocked three-way valve shown in the illustration is to _____.	control the rate of fuel oil flow to the engines	act as an emergency fuel shut off, regardless of the fuel being used	change fuel from heavy to light oil or vice-versa while insuring that oil is returned to the proper day tank	recirculate fuel through the heater during warm-up	See illustration number(s): MO-0058
14	2244	C	Which of the operating characteristics listed applies to the Roots-type blower shown in the illustration?	Each set of lobes is independently driven, assuring proper timing.	Compression of the air is accomplished between the rotors.	Air delivery is approximately proportional to engine speed.	All of the above	See illustration number(s): MO-0082
14	2252	D	Clogged diesel engine fuel oil filters can cause _____,	loss of power	misfiring	low fuel oil pressure	All of the above	
14	2261	A	Before shutting off the fuel supply to stop a medium or high-speed diesel engine, why is it necessary to allow the engine to idle for a few minutes?	To prevent internal damage from local overheating.	To ensure the fuel nozzles are flushed clean.	To clear the smoke stack.	To let the waste heat boiler reduce it's rate of steam generation.	
14	2264	B	A Roots-type blower installed on some diesel engines, serves to _____.	heat the cylinder for hotter compression	push out exhaust gases and replace them with fresh air	force cool air across the radiator, lowering the jacket water temperature	maintain a positive charge of fresh air in the crankcase thus eliminating the chances of a crankcase explosion	
14	2271	C	A normally operating diesel engine is shutdown by _____.	shutting off the air supply	overspeeding the engine	securing the fuel supply	securing the ignition system	
14	2274	D	The compression of air in a positive displacement rotary supercharging blower, occurs only _____.	between the rotating blower lobes	between the casing and blower lobes	after the engine reaches operating speed	as air moves into the discharge passage	
14	2281	B	When running a large, low-speed, main propulsion diesel engine on heavy fuel, which of the following precautions should be observed when switching back over to diesel oil?	The diesel oil must never be allowed to mix with the heavy fuel.	The temperature of the fuel from the preheater should be gradually reduced after switching over the three-way valve.	The heating steam to the preheater should be secured as soon as the diesel fuel passes through the three-way valve.	The heating steam must be secured before the diesel oil passes through the three-way valve.	
14	2284	B	The quantity of air delivered at any given speed by a Roots-type blower, as shown in the illustration, decreases as the pressure ratio increases. This is due to the _____.	decrease in clearance between the mating lobes	increase in air leakage past the rotors	decrease in air leakage past the rotors	increase in clearance between the mating lobes	See illustration number(s): MO-0082
14	2291	C	Cylinder linings constructed as an integral part of the block, are characterized by which of the following disadvantages?	They conduct heat poorly.	They are expensive.	They cannot be replaced.	They require special tools for removal.	
14	2294	D	In the positive displacement rotary supercharging blower illustrated, where does the air become compressed?	Between the rotating blower lobes.	Between the casing and blower lobes.	After the engine reaches operating speed.	As air moves into the discharge passage.	See illustration number(s): MO-0082
14	2301	A	The main propulsion diesel continues running after you try to shut down. You should now attempt to _____.	stop the combustion air supply	engage the jacking gear	secure the lube oil pump	shut off the fuel at the day tank	

14	2304	C	A Roots-type blower installed on a direct reversible engine _____.	is engaged only when turning ahead	is geared so that air flow through the blower is always in the same direction	reverses rotation along with the engine	exhausts to atmosphere when turning astern	
14	2311	D	Before being shut down, a diesel engine should idle a few minutes in order to _____.	prevent governor surging at shutdown	make sure the fuel nozzles are flushed clean	prevent pressure buildup in the fuel lines	prevent damage from localized overheating	
14	2314	B	In the rotary blower shown in the illustration, which direction of rotation do the rotors turn?	Both turn clockwise	"A" turns clockwise; "B" turns counterclockwise	"A" turns counterclockwise; "B" turns clockwise	Both turn counterclockwise	See illustration number(s): MO-0082
14	2321	A	Insufficient end clearance on newly fitted piston rings in a diesel engine will cause the rings to _____.	jam in the least worn part of the cylinder when the rings expand	break in the most worn part of the cylinder when the rings expand	wear eccentrically on the side opposite the end gap	overheat and jam at the top center on the combustion stroke	
14	2324	D	The power consumed during the scavenging process of a diesel engine is known as the _____.	scavenging loss	valve loss	back pressure loss	pumping loss	
14	2331	D	If the piston ring gap remains insufficient when installing new rings, you should _____.	install oversized rings	hone the cylinder liner to allow ring installation	compress the rings tighter with a compressing tool	file the ends of the rings	
14	2341	B	When installing rings on a diesel engine piston, you should check the ring _____.	diametrical tension	gap clearance	radial thickness	face thickness	
14	2351	A	You are installing new piston rings on a single acting diesel engine piston. To check the ring gap clearance, the rings should be placed at the _____.	point of minimum cylinder wear	center of the cylinder	point of maximum cylinder wear	point of maximum ring wear	
14	2354	D	The small clearances existing between each of the blower lobes, and between the lobes and casing of a Roots-type blower, must be maintained to _____.	provide for normal timing	prevent blower oil leakage	provide adequate blower lubrication	prevent abnormal air leakage	
14	2364	C	When the timing gear backlash for a Roots-type blower has become excessive, the problem is properly repaired by _____.	renewing the drive gear	renewing the driven gear	renewing both driving and driven gears as a set	shimming and pinning the gears with proper backlash	
14	2371	A	When a diesel engine is operated with a piston ring having a cold gap clearance less than that recommended by the manufacturer, the ring will _____.	seize and buckle	seat in more slowly	slap in the groove	stick in the groove	
14	2374	D	Which of the following conditions would require the removal of a turbocharger for repair?	Nicked blades	Broken blades	Stretched blades	All of the above	
14	2381	D	Which of the following problems may occur if the clearance between a piston and cylinder liner is insufficient?	Excessive wear	Scuffing of the liner	Piston seizure	All of the above	
14	2384	D	Which of the following precautions should be taken when cleaning the air filter on a diesel engine equipped with a turbocharger?	Reduce engine speed to idle before removing the filter.	Soak the dirty filter in kerosene only.	Blow out the air inlet with compressed air.	Cover the air inlet after removing the filter.	
14	2391	C	A visual inspection of the chrome plated piston compression rings at the liner ports reveals vertical brown streaks on the face of the rings. This condition indicates _____.	a broken ring	normal conditions	ring blow-by	a leaky fuel injector	
14	2394	D	Which of the following conditions may contribute to the formation of deposits on the blades of the turbocharger turbine?	Poor combustion	High cylinder oil consumption	Leaking exhaust valves	All of the above.	
14	2401	A	An examination of the piston compression rings of an efficiently operating diesel engine, should appear with a _____.	shiny face and bottom, black back and top	shiny face, black top, back and bottom	shiny face, bottom, back and top	black face, bottom, back and top	

14	2404	D	Following the failure of one turbocharger on a large, crosshead, main propulsion diesel engine, fitted with multiple turbochargers, which of the following actions should be taken prior to further operation of the engine?	Blank off the exhaust gas inlet to the damaged turbocharger.	Secure cooling and lubrication to the damaged turbocharger.	Lock the rotor of the damaged turbocharger.	All of the above.	
14	2411	C	A bright shiny appearance of the sealing surfaces on diesel engine compression rings indicates _____.	combustion gas blow-by	excessive lubrication	properly functioning rings	insufficient cylinder cooling	
14	2414	B	Which of the listed adjustments must be made to a naturally aspirated four-stroke/cycle diesel engine if a turbocharger is to be installed?	Increase the compression ratio.	Increase the exhaust and intake valve overlap.	Increase the ignition lag.	Decrease the amount of exhaust and intake valve overlap.	
14	2421	C	Visual inspection of chrome-plated piston compression rings reveals a black ring face at the position of the cylinder liner ports. This condition indicates a ring which _____.	has a crown-face	exceeds wear limits through normal wear	has excessive blow-by	is in good condition	
14	2431	A	The face surface appearance of a shallow groove, stainless steel, chrome plated compression ring should exhibit through its operating life a _____.	smooth, shallow groved, chrome surface	smooth surface of stainless steel	smooth surface displaying areas of stainless steel and chrome	surface of gradually deepening grooves	
14	2434	C	Which of the changes in the valve timing listed should be carried out when a naturally aspirated four-stroke/cycle diesel engine is converted to a supercharged engine?	Retard the intake valve opening and advance the exhaust valve closing period.	Advance the intake and exhaust valve opening period.	Advance the intake valve opening and retard the exhaust valve closing periods.	Retard the intake and exhaust valve closing period.	
14	2441	C	When inspecting piston rings through the ports of a two-stroke/cycle diesel engine, black areas on the sealing surfaces are the result of _____.	insufficient lubrication	improper piston cooling	blow-by	overload operation	
14	2444	A	When a naturally aspirated four-stroke/cycle diesel engine is converted for supercharging, which of the following changes must be made to the valve timing?	The intake valve opening is advanced and the exhaust valve closing is retarded.	The intake valve opening is unchanged and the exhaust valve closing is advanced.	The intake valve opening is retarded and the exhaust valve closing is advanced.	The intake valve closing is retarded and the exhaust valve closing is advanced.	
14	2451	D	Black areas on the sealing surfaces of piston rings indicate _____.	lube oil pumping	rotating rings	gas pressure behind the ring	passage of hot gases	
14	2454	D	Which condition indicates the air side fouling of an aftercooler on a turbocharged diesel engine?	An increased air temperature differential between the cooler inlet and outlet.	A decrease in the air pressure differential across the cooler.	Excessive condensate forming in the air box.	A decrease in the air temperature differential between the cooler inlet and outlet.	
14	2461	D	If sludge accumulates on the underside of a diesel engine piston, it will _____.	cause blow-by	chemically attack the piston skirt	form an emulsion of lube oil and water	raise the piston temperature	
14	2464	D	Which of the following conditions can cause below normal air pressure in the intake manifold of a turbocharged diesel engine?	Excessive piston blow-by to the manifold.	Insufficient cooling water flow.	Accumulated water in the air boxes.	Clogged air intake filters.	
14	2471	D	Which of the conditions listed occurring in a diesel engine would cause carbon deposits to develop in the piston ring belt?	Faulty combustion	Excessive ring temperatures	Over lubrication	All of the above.	
14	2481	A	Failure to remove the carbon ridge at the top of the cylinder when removing a piston may result in _____.	damaged upper piston rings and/or ring lands	scored piston walls	damaged cylinder liners	deformed piston skirts	
14	2484	C	Which of the following problems can cause an above normal air temperature to develop in the intake manifold of a turbocharged and aftercooled diesel engine?	Faulty turbocharger turbine diffuser ring	Faulty turbocharger compressor ring	Insufficient cooling water flow	Clogged air intake filters	
14	2491	B	The best tool to use for removing the carbon ridge at the top of an engine cylinder, prior to removing the piston, is to use _____.	an electric grinder	a metal scraper	a reamer	a three-wing hone	

14	2501	A	To facilitate early ring seating of newly installed piston rings, while still providing extended ring wear, _____.	a taper faced ring can be used	the cylinder surface is honed to the smoothest surface attainable	inlaid rings can be utilized in which the chrome center of the ring face slightly protrudes beyond the cast iron edges	rings with increased back clearance are provided	
14	2503	B	In accordance with Coast Guard Regulations (46 CFR), which of the listed starting aids is acceptable for use with the emergency diesel generator?	Injection of ether into the air intake.	Thermostatically controlled electric water jacket heater.	Thermostatically controlled electric oil sump heater.	Heating the starting battery.	
14	2504	C	If the turbocharger of a four-stroke/cycle diesel engine fails to operate, which of the following statements best describes the probable effect?	Intake manifold pressure will be high.	Intake manifold pressure will be unaffected.	Exhaust temperatures will be high.	Exhaust temperatures will be low.	
14	2505	B	A substance found in residual fuels which tends to cause exhaust valve corrosion and grooving, is _____.	carbon	vanadium	calcium	hydrogen	
14	2506	C	If a crankcase explosion occurs in a diesel engine, which of the listed actions should be taken?	Open the crankcase immediately to check for damage.	Apply fire fighting water through the crankcase breather.	Allow the engine to cool before opening the crankcase.	Assume that there is no damage to the crankshaft.	
14	2511	B	Which of the following statements is true regarding the installation of piston rings on two-stroke/cycle, diesel engines as compared to four-stroke/cycle, diesel engines?	In a two-stroke/cycle engine, the rings run hotter, requiring the end gap to be greater.	Some provision must be made in a two-stroke/cycle engine to keep the rings from binding in the ports.	No gap is required to exist between the ends of the ring when cold in a two-stroke/cycle engine, but a small gap is required in a four-stroke/cycle engine.	The end gaps should be staggered on either side of a piston in a two-stroke/cycle engine, while staggering is not necessary in a four-stroke/cycle engine.	
14	2513	D	Which of the following precautions must be taken if an electric immersion heater is used to keep the coolant in a diesel engine warm during the time the engine is secured?	The coolant temperature must be maintained at 180°F.	The thermostatic bypass valves must be manually opened before the engine is started.	The pressure cap must be removed while the engine is secured.	Electrical power to the heater must be secured before the cooling system is drained.	
14	2515	C	The manufacturer of a particular diesel engine recommends when running on heavy fuel for the vanadium content not to exceed 300 ppm. If there are 10 ounces of vanadium per 3125 pounds of fuel just taken on board, which of the following statements is correct?	The vanadium content is 2 ppm.	The vanadium content is slightly above acceptable values.	The vanadium content is well within recommended limits.	The vanadium content will accelerate cylinder wear.	
14	2516	C	If a crankcase explosion occurs in a diesel engine, you should stop the engine and _____.	immediately open all crankcase relief ports	increase crankcase exhauster speed to draw cool air into the engine	allow the engine to cool naturally	increase crank case scavenge air to remove unburned gases	
14	2521	B	The service life of a worn aluminum piston for an auxiliary diesel, for which no spares are readily available, can be extended by _____.	turning down the piston skirt to concentric values	knurling the piston skirt surface	building up the piston skirt with a liquid epoxy material and then remachining	increasing the dimensions of the ring land grooves	
14	2523	B	Coast Guard Regulations (46 CFR) state that emergency diesel generator starting systems must have sufficient capacity to provide at least _____.	3 continuous starting sequences	6 consecutive cranking cycles	9 repeated starts under load	12 cranking periods of 5 seconds each	
14	2524	D	If the turbocharger failed on an auxiliary diesel engine, which of the following conditions would probably occur?	Full power cannot be developed.	The exhaust will contain black smoke.	Complete combustion will be impossible.	All of the above.	
14	2525	D	The desirable properties of a marine fuel oil should include _____.	high flash point and high viscosity	low flash point and high viscosity	low heating value and high sulphur content	high heating value and low sulphur content	
14	2526	A	If a diesel engine has been stopped because of piston seizure due to severe overheating, the crankcase _____.	inspection covers should not be opened until the engine has cooled	ventilation system should be continued in operation for one hour for cooling	scavenge pump should be immediately secured to prevent loss of lube oil	explosion covers should be opened slightly to provide extra ventilation	

14	2531	D	Which of the following conditions can result in the cracking of the piston lands?	High lubricating oil temperature	Dirty lubricating oil	Minimal cylinder liner wear	Insufficient ring groove clearance	
14	2533	C	Which of the listed devices is the only method allowed by Coast Guard Regulations (46 CFR), to ease the starting of emergency generator engines?	Bayonet-type electrical oil heaters.	Steam or hot water lube oil heating.	Thermostatically controlled electric water jacket heating.	Electric resistance heaters in the air intake manifold.	
14	2534	A	A sudden power loss from a turbocharged and aftercooled diesel engine is an indication of a/an _____.	turbocharger malfunction or failure	crankcase exhauster overload	overload on the intercooler	obstruction in the engine cylinders	
14	2535	B	Heavy fuel oils generally have an upper average ash content of 0.1% by weight. Which of the following conditions could be expected if the ash content increases above this amount?	Glazing of the cylinder liners	Increased valve wear	Excessive oil pumping	Increased fuel consumption	
14	2536	D	If a crankcase explosion has occurred in a diesel engine, and the crankcase remains intact, which of the following precautions should be observed?	The cylinder indicator cocks should be opened.	The sump lube oil scavenge pump should be secured immediately.	The explosion relief valves should be manually opened.	The crankcase should remain unopened until the engine has cooled.	
14	2541	D	Excessive side clearance between a piston ring and its groove will cause the ring to _____.	expand excessively under operating temperatures	scuff the cylinder liner excessively	hammer the piston land above the ring	hammer the piston land below the ring	
14	2543	D	Cold weather starting of a diesel engine may be made easier by _____.	decreasing the compression ratio	using a special fuel having a high ignition temperature	increasing the starting air supply	heating the jacket water	
14	2544	D	A thin film of oil on the lobes of a Roots-type blower indicates _____.	proper lubrication	timing out of adjustment	excessive cylinder lubrication	leaking rotor bearing oil seals	
14	2545	D	Corrosion and grooving on the blading of an exhaust driven turbocharger is caused by certain components of residual fuel oils. These components are vanadium, sodium, and _____.	copper	carbon	hydrogen	sulfur	
14	2546	D	If a crankcase explosion occurs in a diesel engine equipped with the device shown in the illustration, _____.	piece #2 will move to the right	piece #5 will rotate counterclockwise as viewed from the right	piece #7 will move to the left	spring #11 will be compressed	See illustration number(s): MO-0105
14	2551	B	If the back clearance of a piston ring is excessive, _____.	compression pressure in the cylinder will be higher	carbon will accumulate behind the ring	combustion gases will penetrate beneath the ring land	piston side thrust will be increased	
14	2553	D	Starting a large low-speed propulsion diesel engine on diesel fuel during cold weather conditions, will be made easier by _____.	increasing the quantity of starting air	increasing the lube oil pressure	heating the engine fuel supply	heating the engine coolant	
14	2554	D	Leaking oil seals on a diesel engine turbocharger can cause _____.	the engine to run after the fuel has been secured	the engine to overspeed	a fire	all of the above	
14	2555	D	Burning fuel with a high sulfur content in a diesel engine will _____.	increase thermal efficiency	cause clogging of the fuel system	increase the ability of the engine to start in cold weather	produce corrosion in the cylinder and exhaust system at low loads	
14	2556	B	What is the purpose of the device shown in the illustration?	Regulate lube oil pressure in a diesel engine.	Protect the crankcase from overpressure in the event of explosion.	Utilize exhaust gas pressure to supercharge a diesel engine.	Secure the engine in the event of dangerous overspeed.	See illustration number(s): MO-0105
14	2561	C	In certain cases, a cylinder liner can be refinished rather than replaced. When properly honed, the _____.	cylinder should be cleaned with kerosene	cylinder liner should have a glazed appearance	liner surface should have a crosshatch pattern	counterbore is slick and smooth	
14	2563	A	Jacket water heaters are used on diesel engines to _____.	help the engine start easier in cold weather	maintain the proper jacket water pH	maintain the proper expansion tank water level	keep the engine room warm	

14	2565	D	Which of the following problems may occur when using fuel oil with a high sulphur content?	Injection lag	Lube oil dilution	Preignition	Corrosion	
14	2571	B	A properly honed diesel engine cylinder liner will _____.	prevent piston ring wear	shorten the ring break-in period	prevent cylinder liner glazing	appear slick and glazed	
14	2575	B	The consistent burning of fuel oil with a high sulfur content in a diesel engine will result in _____.	clogged fuel injection pumps	increased cylinder liner wear	intake valve stem corrosion	varnish deposit on pistons	
14	2584	D	The large number of mechanical and pulsating vibrations developed in a diesel engine may damage an attached _____.	scavenged air pump because it is designed for steady state operation rather than pulsating gas load	reciprocating scavenge pump because of its direct linkage to the crankshaft	rotary blower because it operates at close tolerances over a small range of speeds and delivers its air charge at a certain resonant frequency	gas driven turbocharger because it has a wide speed range and high temperature materials that are subject to resonant vibration	
14	2585	A	The burning of fuel oil in a diesel engine having a high sodium content, will cause _____.	corrosion and grooving of exhaust valves	corrosion and gumming of the fuel injection pump	salt deposits in the exhaust manifold	slag deposits in the fuel injection equipment	
14	2591	C	Which of the following statements concerning cylinder liner wear in a single acting diesel engine is correct?	Uniformly excessive liner wear will not cause wear on the piston rings and grooves.	Liner wear is distributed equally between upper and lower portions of the cylinder.	Excessive liner wear causes wear between piston rings and grooves.	Liner wear is normally greatest in the middle of the cylinder.	
14	2593	D	Diesel engine starting difficulties due to cold intake air temperatures, can be overcome by using a/an _____.	increase in starting air pressure	increase in lube oil viscosity	compression expansion device	jacket water heater	
14	2594	C	A turbocharged and aftercooled diesel engine can overspeed due to _____.	air in the hydraulic governor	high ambient air temperature	oil leaking into the turbocharger compressor end	insufficient piston ring blow-by	
14	2595	B	The cetane number rates fuels for diesel engines according to its _____.	antiknock characteristics	ignition qualities	rates of vaporization	viscosity	
14	2601	C	Generally, where should you expect to find the greatest amount of wear on a cylinder liner?	Adjacent to the piston skirt when the crank is on TDC.	Along the lower part of the liner wall opposite the oil control ring.	Opposite the top ring shortly after piston travel has ended the compression stroke.	Opposite the oil control ring when the crank is on bottom dead center.	
14	2605	A	In diesel engineering practice, the term used to express the ignition quality of a particular fuel is _____.	cetane number	octane number	ignition index number	volatility point	
14	2611	D	The rate of wear on a cylinder liner depends on the _____.	quality of air filtration	effectiveness of lubrication	type of fuel used	all of the above	
14	2613	C	When starting a diesel engine at temperatures below 70°F, the frictional resistance to turning will be _____.	reduced by increasing lube oil pressure	controlled by reducing the compression ratio	proportional to the lube oil viscosity	eliminated by heating the intake air	
14	2614	D	Which of the following conditions may be attributed to a fouled turbocharger compressor inlet screen or filter?	Decreasing scavenge air pressure.	Increasing exhaust temperatures before the turbine.	Reduction in engine speed.	All of the above	
14	2615	B	The ignition quality of diesel fuel is indicated by its _____.	octane number	cetane number	viscosity in Saybolt seconds	air fuel ratio	
14	2621	C	A scored diesel engine cylinder liner will cause _____.	high firing pressure	abnormally high cooling water temperature	rapid wearing of piston rings	combustion gases in the cooling water	
14	2623	C	Cold weather starting of a diesel engine is more difficult than warm weather starting due to _____.	use of low viscosity oil in cold weather	increased moisture content of inlet air in cold weather	increased drag of pistons and bearings due to increased oil viscosity	higher compression pressures reached due to smaller clearances existing in the engine during cold weather	

14	2624	B	Why will a turbocharged diesel engine produce black smoke if excessive additional load is applied too quickly?	Exhaust energy would draw excess air.	The inertia of the turbocharger rotor causes a time lag which delays the turbocharger speed increase.	Exhaust gas pumping losses are increased due to turbine windage.	Exhaust gas back pressure falls slightly due to increased nozzle action.	
14	2625	D	Which of the listed factors will indicate the most about the ability of a fuel to ignite in a diesel engine?	Viscosity	Sulfur content	Pour point	Cetane number	
14	2631	B	If the threads on the tappet screw part #14, shown in the illustration are worn, you should _____.	replace part #14	replace parts #13 and #14	run a die over the threads of part #14	use a double locknut	See illustration number(s): MO-0027
14	2641	A	If the manufacturer's instructions do not state otherwise, which of the following number progressions represent the best probable order for tightening the head bolts shown in the illustration?	1 5 3 7 2 6 4 8	1 2 3 4 5 6 7 8	2 4 6 8 1 3 5 7	7 2 3 6 5 8 4 1	See illustration number(s): MO-0028
14	2643	D	Starting aids, such as glow plugs, are installed on _____.	large, direct drive diesel engines	diesel engines designed to burn residual fuels	medium-speed, four-stroke/cycle diesel engines	small diesel engines started with an electric motor and batteries	
14	2645	D	The cetane number of a diesel fuel oil indicates its _____.	viscosity	acid content	heating value	ignition quality	
14	2653	A	Air motors used for starting some auxiliary diesel engines are generally the type known as a/an _____.	vane motors	plunger motors	gear motors	accumulator motors	
14	2655	A	The cetane rating of diesel fuel is an indication of the _____.	ignition quality of the fuel	calorific value of the fuel	flash point of the fuel	rate of fuel consumption	
14	2663	C	The diesel engine starting motor shown in the illustration, is actuated by _____.	electric current	hydraulic compression	compressed air	none of the above	See illustration number(s): MO-0044
14	2671	C	Which of the following conditions could contribute to the cracking of a diesel engine cylinder head?	Leaking seal ring	Insufficient heat transfer from the exhaust valves	Blocked cooling water passages to the head	Excessive scavenging air provided to the engine	
14	2673	B	Fluid type starting motors used for starting auxiliary diesel engines may either be of the piston type or the _____.	gear type	vane type	impeller type	accumulator type	
14	2675	B	The ignition quality of diesel fuel oil is indicated by the _____.	specific gravity	cetane number	viscosity	calorific valve	
14	2681	D	To measure bearing clearances, a special small diameter plastic rod (plasti-gage) is placed between the crankshaft journal and the connecting rod bearing shell. The actual reading is obtained by _____.	using a micrometer to determine the thickness of the crushed plastic rod	accurately measuring the elongation of the plastic rod along the bearing surface	directly measuring the width of the flattened plastic rod with a vernier caliper	using the paper or cardboard gauge printed on the plastic rod package to measure the flattened width	
14	2683	D	Which of the listed devices is often clutched to the flywheel of small and medium size diesel engines for the purpose of starting?	Magneto	Electric generator	Electronic SCR	Air motor	
14	2685	A	The ignition quality of a diesel fuel is indicated by the _____.	cetane number	volatility point	viscosity index	octane number	
14	2691	D	To determine the main bearing clearance of a propulsion diesel engine, you should measure the main bearing shell using a ball anvil outside micrometer and measure the crankshaft journal using a/an _____.	telescoping gauge	ring "snap" gauge	inside vernier caliper	outside micrometer	
14	2693	C	Which internal combustion engine starting system uses a vane type fluid motor?	Jet flow	Electric	Compressed air	Centrifugal	

14	2695	C	Which of the following represents the significance the fuel oil cetane number?	The cetane number has no affect on injection lag.	The cetane number is an indication of the fuel's viscosity.	Ignition lag is reduced with fuels having a high cetane number.	The cetane number is of little significance in the combustion process.	
14	2701	C	On a large low-speed main propulsion diesel engine, lower main bearing wear is usually measured by using a/an _____.	dial indicator	outside caliper	bridge gage	tram rod	
14	2703	C	An air starting motor for a diesel engine is protected from overspeeding by _____.	an electric solenoid interlock	a three-way automatic valve	an overrunning clutch	all of the above	
14	2705	B	The ignition quality of a fuel oil is an important operational consideration because it _____.	indicates the amount of abrasive material in the fuel	affects the starting ability of a cold engine	determines the amount of fuel penetration	affects the compression ratio of an operating engine	
14	2711	A	Which of the devices is commonly used in measuring the clearances between the main engine bearings and the crankshaft?	Plasti-gage	Depth gage	Copper shims	Wooden gaging pegs	
14	2713	C	In addition to a main engine driven starting air compressor, another air compressor, driven by a separate power source, is installed to _____.	provide air for engine scavenging	provide air for engine supercharging	supply a backup source of starting air	supply the independent source of reversing air	
14	2715	B	Fuel oil having a low cetane rating could result in _____.	improved cold weather starting	excessive fuel oil consumption	reduced ignition lag	smoother engine operation	
14	2721	C	To determine the main bearing clearances in a diesel engine, you should use _____.	a depth micrometer	an anvil faced micrometer	plasti-gage	a vernier caliper	
14	2723	D	The starting air supply for a diesel engine is generally produced by a/an _____.	exhaust powered turbocharger	Roots-type blower air pump	centrifugal air compressor	multistage reciprocating air compressor	
14	2725	C	Which of the following statements is true concerning the cetane number of diesel fuel?	The cetane number affects the amount of injection lag.	The cetane number is an indication of the fuel's viscosity.	Ignition lag is reduced with fuels having a high cetane number.	The cetane number is of little significance in the combustion process.	
14	2733	B	Where is the charge for an air starting system stored?	Air compressor	Pressurized tank	Distributor assembly	Cylinder check valve	
14	2735	D	Which of the following statements is true concerning the cetane number rating of diesel fuel?	The cetane number is obtained by comparing the fuel with cetane, a colorless liquid hydrocarbon.	The higher the cetane number, the shorter the ignition lag.	The highest cetane number of fuel is 100.	All of the above.	
14	2741	A	The insertion of shims between the foot of a marine type connecting rod and a bearing box would result in _____.	increased compression ratio	decreased compression ratio	increased bearing clearance	decreased bearing clearance	
14	2743	B	Intercoolers installed on starting air compressors, reduce the possibility of _____.	dust entering the high pressure stage	lube oil carbonization	discharge pulsations	interstage vapor lock	
14	2745	D	The longer the ignition delay period resulting from improper use of low cetane fuel, the _____.	less fuel will enter the cylinder	higher the cylinder combustion temperature	more complete the fuel combustion	more rapid the rise in combustion pressure	
14	2751	C	Which of the following operating conditions can occur when shims are removed from the joint between the foot of a marine type diesel engine connecting rod and the bearing box?	Decreased connecting rod bearing clearance	Increased connecting rod bearing clearance	Decreased compression ratio	Increased compression ratio	
14	2753	D	A two-stroke/cycle diesel engine requires less starting air than a four-stroke/cycle diesel engine, of equal displacement, because the two-stroke/cycle diesel engine _____.	has little or no internal friction	has a lower effective compression ratio	operates with scavenge air under a positive pressure	operates without energy absorbing intake and exhaust strokes	
14	2755	A	With respect to diesel fuel, the ease with which a cold engine will start is dependent upon the _____.	ignition quality of the fuel	high heating value of the fuel	amount of carbon residue after combustion	internal flow resistance in the injectors	

14	2761	B	Worn main bearings will cause the compression ratio of an auxiliary diesel engine to _____.	increase	decrease	remain the same	increase on compression; decrease on expansion	
14	2763	C	Starting systems for large, low-speed, direct reversing, main propulsion diesel engines are usually _____.	hydraulic starting motor	electric starting motor	direct air admission	vane type air motors	
14	2765	B	A mixture of 45% cetane and 55% alpha-methyl-naphthalene is found to have the same ignition delay as a sample of diesel oil. The sample can be described as having a/an _____.	cetane number of 55	cetane number of 45	octane number of 55	octane number of 45	
14	2771	C	In a large, low-speed diesel engine the clearance between the piston crown and cylinder head is found to be excessive. In order to correct for this, you should _____.	build up the piston crown by metal spraying	build up the cylinder head by metal spraying	insert shims between the crankpin bearing box and the connecting rod foot	install a thinner head gasket	
14	2773	C	Which of the listed types of starting systems is often used on large, low-speed, direct reversing, main propulsion diesel engines?	Electric	Hydraulic	Air	All of the above	
14	2780	A	An acceptable method of measuring for the correct rotational force applied to the connecting rod and main bearing bolts, is to use a _____.	torque wrench	monkey wrench	pipe wrench	slugging wrench	
14	2781	A	Which of the following relationships should occur between the temperature developed in a combustion space, and the compression ratio of the engine?	Higher compression ratios create higher temperature.	Higher temperatures create higher compression ratios.	Lower temperatures create higher compression ratios.	Higher compression ratios create lower temperatures.	
14	2783	C	Which of the following statements is true concerning the air starting valve, labeled "III", as shown in the illustration?	When starting, the air starting valve is held open by air pressure.	When starting air is secured, the air starting valve is closed.	The air starting valve is opened by cam action.	During normal engine running, the air starting valve opens and closes constantly due to cam action.	See illustration number(s): MO-0046
14	2785	B	Injection lag in a diesel engine may be caused by _____.	a higher cetane number of fuel oil	the diesel fuel used having a high viscosity	mechanical rigidity in the lube pump mechanism	a decrease in the fuel pump delivery pressure	
14	2791	C	Abnormal crankpin bearing and piston skirt surface wear indicate _____.	a restricted air intake	a clogged connecting rod oil passage	incorrect connecting rod alignment	high cylinder firing temperatures	
14	2793	A	Which of the following statements describes the operational characteristics of figure "B" in the illustration?	The valve will lift abruptly.	Full valve opening will occur slowly.	The valve will reseat abruptly.	The valve gear will not bounce.	See illustration number(s): MO-0045
14	2795	A	Diesel engine injection lag is caused by _____.	compressibility of the fuel	high fuel oil supply flow	scored plunger and barrel packing	excessive air turbulence	
14	2803	D	The pilot valves in an air pilot starting system for a two-stroke/cycle, direct-reversing, main propulsion diesel engine are operated by either a ported distributor disc or a/an _____.	regulator valve	quick opening main air valve	pilot air start check valve	individual cam for each pilot valve	
14	2805	C	Fuel oil injected into the cylinder of a diesel engine just after the piston passes top dead center, will _____.	increase engine power	increase engine load	decrease engine power	improve fuel economy	
14	2811	C	Diesel engine crankshaft deflection readings are generally taken at four crank positions. Good engineering practice requires the deflection gage or indicator to be _____.	placed as near the crankpin axis as possible	removed each time the crankshaft is repositioned	left in place for all four readings	reset to zero for all four readings	
14	2813	B	The four cams shown in the illustration are in position with their respective pistons at top dead center. Which of the cams is the air starting cam?	A	B	C	D	See illustration number(s): MO-0045
14	2815	B	Heat for igniting the fuel oil in the cylinder of a diesel engine is generated by the _____.	electronic ignition system	compression of air by the piston	friction in the fuel injector	fuel oil heating system	

14	2821	D	One method of determining crankshaft misalignment is by _____.	laying a straight edge across the crank webs at the crankpin and measuring the distance to the crankpin in two places	measuring the crank drop on either side of each crank throw while the crankshaft is slowly rotated through one revolution	rotating the crankshaft through one revolution, pausing each 90° of rotation to measure bearing clearances, top and bottom	taking micrometer readings between the crank cheeks opposite the crankpin every 90° of crank angle rotation	
14	2823	C	Cams used to activate mechanically operated air starting valves on four-stroke/cycle diesel engines should have which of the valve lift profiles listed?	Abrupt lift with a short open period, and abrupt valve seating.	Gradual lift with a short fully open period, and accelerated valve closing.	Abrupt lift giving full valve opening for a long period, with gradual valve seating.	Gradual lift giving full valve opening for a long period, with gradual valve seating.	
14	2825	B	The minimum fuel oil delivery pressure required for diesel engine injection depends primarily on the _____.	degree of cylinder air turbulence	firing pressure in the engine	quality of fuel to be injected	duration of the ignition delay period	
14	2831	C	Which instrument is used to take crankshaft deflection readings?	Web deflection gage	Outside micrometer	Strain gage	Gage block	
14	2833	C	The timing of diesel engine air starting valves is controlled by _____.	the air start valve timing gears and rods	a cylinder check valve	individual cams and valve gear	an air manifold poppet valve	
14	2840	B	On an opposed-piston engine lower crank lead can be adjusted to change which of the listed operating conditions?	Longer combustion events.	Exhaust events starting before scavenging events.	Exhaust events lasting longer than scavenging events.	Higher combustion temperatures.	
14	2841	A	Exhaust valve timing for the engine, shown in the illustration, is to be set at 106° after top dead center. To what position should the flywheel be rotated to set the exhaust valve timing on the #11 cylinder?	61°	209°	315°	360°	See illustration number(s): MO-0039
14	2843	D	Diesel engine air start valve timing is controlled by _____.	engine operating speed	an air manifold	a hydraulic distributor	individual cams and valve gear	
14	2845	C	In the cylinder of a diesel engine, fuel is ignited by the _____.	spark from a plug in the precombustion chamber	electrical discharge from the distributor	heat of compression within the cylinder	heat from the fuel injection nozzle	
14	2851	B	If there is a "clicking" sound in the valve compartment of a diesel engine, the cause may be _____.	a worn wrist pin	excessive valve lash	worn connecting rod bearings	all of the above	
14	2853	C	During the starting of a diesel engine, compression gases are prevented from backing into the air starting system, shown in the illustration, by the _____.	air starting control valve	individual distribution valves	cylinder air starting check valves	high pressure in the starting air manifold	See illustration number(s): MO-0046
14	2861	C	A loud clicking noise from the valve compartment of an operating diesel engine would indicate _____.	worn valve seats	worn main bearings	excessive valve clearance	weak rocker arm springs	
14	2871	C	Excessively worn, or polished ends on a diesel engine valve spring, indicate _____.	burned exhaust valves	excessive spring compression	spring surge	worn valve seats	
14	2873	C	The items, shown in the illustration, labeled "P" are _____.	water cooling valves	cylinder quill lubricators	air check valves	diffuser vanes	See illustration number(s): MO-0003
14	2881	B	When a hydraulic valve lifter is on the base circle of the cam, "zero" valve lash is maintained by the _____.	valve spring	plunger spring	oil pressure	rocker arm	
14	2883	A	What type of valve, shown in the illustration, is indicated by the letter "I"?	Air start check valve	Air start valve	Reversing air valve	Pilot air valve	See illustration number(s): MO-0046
14	2885	D	Fuel oil day tanks for diesel engines must be checked and cleaned at regular intervals in order to remove _____.	sludge	water	micro-organism growth	all of the above	
14	2891	D	Small cracks in the crankshaft bearing surface of a diesel engine are an indication of _____.	corrosion fretting	insufficient lubrication	abnormal wear	fatigue failure	
14	2893	B	Which type of diesel engine air start system is shown in the illustration?	Direct mechanical type	Direct mechanical type with check valve	Pilot operated type	Distributor type	See illustration number(s): MO-0046

14	2895	B	Which of the listed pumps, shown in the illustration, discharges directly to the fuel oil settling tanks of a diesel engine main propulsion plant?	Booster pump	Transfer pump	Auxiliary bilge pump	Centrifuge transfer and discharge pumps	See illustration number(s): MO-0058
14	2901	A	The trouble most commonly experienced with the cam follower part #7, shown in the illustration is _____.	wear	misalignment	improper valve adjustment	loose-lock pins	See illustration number(s): MO-0027
14	2903	C	Which of the following methods is used to prevent throttling of compressed air through the diesel engine air starting valves?	Holding the valve open for a long period	Increasing the starting air pressure used	Opening the starting air valve quickly	Reducing the starting air valve size	
14	2905	D	The depth of fuel oil in a tank is normally measured through the _____.	vent line	overflow line	feed line	sounding tube	
14	2911	B	An eight cylinder, four stroke/cycle, single acting diesel engine has a 650 mm bore and a 1400 mm stroke. What will be the developed indicated metric horsepower if the average mean effective pressure is 30 kg/cm2 at a speed of 100 RPM?	1689 kW	9,111 kW	12,388 kW	24,776 kW	
14	2913	B	Starting air valves are held firmly on their seats by _____.	cam rollers on the camshaft	spring force	air pressure on top of the valve differential piston	air pressure on the bottom of the valve differential piston	
14	2915	D	Fuel oil is regularly transferred to the day tank in order to _____.	allow impurities to settle out of the fuel	allow air to escape from the fuel	make fuel available for immediate use	all of the above	
14	2921	D	Following an overhaul of a crosshead type diesel engine, the engine is jacked over with the turning gear as part of the pre-start procedure. Which of the listed pre-start procedures should be carried out?	Ensure proper cylinder lube oil flow.	Open all air space drain cocks.	Open all indicator valves.	All of the above.	
14	2923	B	The valve shown in the illustration is opened by _____.	a rocker arm	air pressure	cylinder pressure	a cam follower	See illustration number(s): MO-0107
14	2931	D	If water is found in the crankcase of a diesel engine, the cause may be due to _____.	a cracked cylinder head	a leaky cylinder head gasket	a cracked cylinder liner	all of the above	
14	2933	A	A six-cylinder, four-stroke/cycle diesel engine is fitted with a rotary distributor type air starting system. The speed of the rotating distributor disc is _____.	one-half engine speed	the same as engine speed	twice engine speed	four times engine speed	
14	2935	C	Standby, or emergency diesel generator day tanks should always be kept full to reduce the possibility of _____.	sediment contamination	fuel filter clogging	moisture formation	inadequate transfer pump suction head	
14	2941	B	How does water enter the crankcase of a diesel engine?	Through the crankcase exhauster.	As water vapor contained in blow-by.	Demulsifying lube oil passing through the main bearings.	Condensation from vapor formed in the expansion tank.	
14	2943	D	An accumulator used in a hydraulic starting system is generally located between the _____.	pump and the compressor	storage tank and the pump	starting motor and the reserve tank	pump and the starting motor	
14	2945	A	The diesel engine shown in the illustration has the highest fuel pressure developed in the part labeled _____.	E	X	Y	Z	See illustration number(s): MO-0003
14	2953	D	The device used to store a charged pressure for an hydraulic starting system is called the _____.	reservoir	hand pump	accelerator	accumulator	
14	2955	A	Which of the listed contaminants will be satisfactorily removed from fuel oil by centrifuging?	Sludge	Diesel fuel	Lube oil	Gasoline	
14	2961	A	Water accumulating in the crankcase of a diesel engine could indicate _____.	a cracked cylinder liner	excessive water in the fuel	a leaking intercooler	excessive moisture in the scavenge air	
14	2963	B	Which of the following statements is true concerning the hydraulic starting system shown in the illustration?	Reservoir "A" maintains pressure on the accumulator "E".	The right end of the accumulator "E" is charged with nitrogen.	This system cannot operate at temperatures below 32,F.	Hand pump charging of the system is possible, but a minimum of 20 minutes is required for hand charging.	See illustration number(s): MO-0049

14	2965	B	One engine manufacturer recommends heavy fuel oil should not be heated above 80°C to 95°C (176°F to 203°F) before purification. This upper limit should be observed to ensure against _____.	flattening of the bowl neoprene O-rings	operation within the explosive range of the fuel	excessive purifier operating pressures	excessive oil viscosity	
14	2971	C	Excessive valve clearance will cause a valve to open _____.	early and close early	early and close late	late and close early	late and close late	
14	2973	A	In a hydraulic starting system, oil to the starting motor flows from the _____.	accumulator	reservoir	hand pump	electric pump	
14	2975	B	On board supply vessels, a centrifuge is normally used to purify _____.	cooling water	fuel oil	sea water	diesel intake air	
14	2981	D	What will cause valve stem blow-by to the valve section shown in the illustration?	A cracked lower spring plate.	Worn, broken or stuck compression rings.	Damaged rubber rings on the valve seat insert.	Defective rubber seal rings in the valve guides.	See illustration number(s): MO-0030
14	2983	A	The accumulator shown in the illustration can be charged by the _____.	hand pump	cranking motor	reservoir pump	starter control valve	See illustration number(s): MO-0049
14	2985	A	The most effective method in removing water from diesel fuel oil is by _____.	centrifuging the fuel	using it in the engine	heating the fuel tanks	straining the fuel	
14	2991	A	In a four-stroke/cycle diesel engine, piston blow-by can result in increased _____.	crankcase pressure	compression pressure	scavenge air pressure	exhaust manifold pressure	
14	2993	A	The diesel engine starter least likely to be affected by low ambient temperatures, is the _____.	hydraulic starting system	electric (battery) starting system	glow plug starter	gasoline engine starter system	
14	3001	C	Diesel engine piston ring blow-by is usually caused by excessive ring clearance at the ring _____.	back	side	gap	bottom	
14	3002	B	During diesel engine warm-up, which type of valve lash adjuster listed allows for the change in length of the exhaust valves?	Mechanical	Hydraulic	Pneumatic	Electrical	
14	3003	D	Hydraulic starters are installed on many lifeboat diesel engines instead of comparable air start systems, because _____.	hydraulic starters are the least expensive of all starting systems	the system does not require high pressure piping	hydraulic systems turn diesel engines at higher rates of speed than air starters	the system can be manually recharged	
14	3004	D	Which of the bearings listed below is most widely used for the main and connecting rod bearings of a modern high-speed diesel engine?	Steel-lined	Poured babbitt, self-aligning	Split roller	Precision insert	
14	3005	A	For optimum results, centrifugal purification of heavy fuel oil should be accomplished with the fuel at the lowest practicable _____.	throughput	additive percent	cetane number	TBN number	
14	3006	A	Which of the tanks, shown in the illustration, supplies fuel to the emergency generator?	Light fuel oil service tank	Light fuel oil settling tank	Light fuel oil boiler tank	Light fuel oil booster tank	See illustration number(s): MO-0058
14	3011	D	In a diesel engine, blow-by is generally the result of worn _____.	valve guides	oil control rings	valve seats	compression rings	
14	3012	C	The valve stem expansion associated with engine warm-up is allowed for by the _____.	valve springs	hydraulic governor	valve lash adjusters	cooling system	
14	3014	D	Which of the bearing types listed is commonly used for main bearings in small internal combustion engines?	Precision-type with shims	Poured-type consisting of babbitt	Poured-type with shims	Replaceable precision-type	
14	3015	D	Heavy residual fuel oils are heated prior to centrifuging to _____.	reduce fuel weight	increase specific gravity	separate fuel from lube oil	reduce fuel viscosity	
14	3021	C	One cause of diesel engine piston ring blow-by is _____.	reduced scavenging	high exhaust temperatures	excessive lubrication	floating piston pins	
14	3024	B	Bearing clearances in small high-speed diesel engines should be measured with _____.	gage blocks	plasti-gage	feeler gage	round solder wire	
14	3025	A	Which of the types of motors listed is used in a hydraulic starter?	Piston	Gear	Turbine	Centrifugal	
14	3031	C	Diesel engine "blow-by" into the crankcase is caused by excessive ring _____.	back clearance	side clearance	gap clearance	taper clearance	

14	3032	A	The valve bridge, illustrated, allows for _____.	two exhaust valves to be operated from one rocker arm	the exhaust valves to be lubricated through an internal lube oil passage	positive closing action of the exhaust valves	positive rotation of the exhaust valves	See illustration number(s): MO-0019
14	3033	B	Which type of motor listed is used as a hydraulic starter?	Turbine	Piston	Gear	Vane	
14	3034	B	The part labeled "F" shown in the illustration, is the _____.	connecting rod cap	bearing shell halves	connecting rod bushing	piston pin bushing	See illustration number(s): MO-0040
14	3035	B	A centrifuge will satisfactorily remove which of the following contaminants from fuel oil?	Gasoline	Water	Lubricating oil	Sulphur compounds	
14	3042	B	Which operating characteristic is indicated in the valve bridge and hydraulic lash adjuster assembly shown in the illustration?	The exhaust valves are closed by the action of the bridge spring.	The lash adjuster maintains zero lash between the end of the valve stem and the valve bridge.	The ball check is always seated when the exhaust valve is closed.	The bridge spring applies pressure to maintain contact between the plunger and the exhaust valve.	See illustration number(s): MO-0019
14	3043	B	When an engine fitted with a hydraulic starting system starts up, the starter is protected from the higher speed of the engine by _____.	the immediate increase in hydraulic pressure	the overrunning clutch	closing the starting check valves	the pivoting of the shaft from being engaged with the flywheel	
14	3045	B	If fuel oil were being discharged from the waste water outlet of a fuel oil disk type centrifuge, operated as a separator, you should _____.	remove the discharge ring	reprime the purifier	slow the centrifuge to its proper speed	install an additional discharge ring	
14	3051	B	In a diesel engine, blow-by is a result of combustion gases leaking into the crankcase past the _____.	wrist pin bushings	compression rings	cylinder liner seals	cylinder liner sealing ring	
14	3052	D	Which of the following statements is true concerning the diesel engine valve gear shown in the illustration?	Both exhaust valves are operated simultaneously from one rocker arm by a valve bridge.	Valve lash is mechanically adjusted.	The engine head is fitted with replaceable valve seats.	All of the above.	See illustration number(s): MO-0013
14	3053	B	In a Bendix starter drive, the initiation of pinion engagement with the flywheel ring gear is by _____.	Bendix spring pressure	starter drive shaft rotation	a differential spring	solenoid throw out action	
14	3054	D	Which of the following mechanisms is a feature of the standby diesel engine shown in the illustration?	The camshaft rotates at the same speed as the crankshaft.	The exhaust valve cam follower is located below the camshaft.	The pistons ride in dry-type cylinder liners.	Fuel pump camshafts are located on each side of the engine.	See illustration number(s): MO-0005
14	3055	C	A centrifugal fuel oil purifier should be shut down if _____.	more sealing water is needed	the cover clamp needs tightening	the purifier has a bad vibration when started	water is discharged from the overflow line	
14	3061	B	Diesel engine blow-by is the leakage of combustion gases past the _____.	oil rings only	compression and scraper rings	cylinder liner sealings	cylinder liner ring grooves	
14	3063	B	In a starting motor equipped with a Bendix drive, the pinion moves and meshes with the flywheel ring gear due to _____.	the mechanical linkage	the threaded sleeve's rotation	centrifugal force	electromotive force	
14	3064	D	The camshaft on a four-stroke/cycle diesel engine is used to operate the _____.	fuel injectors	exhaust valves	intake valves	all of the above	
14	3065	C	If the bowl of a disk type centrifugal purifier when operated as a separator is not primed, the _____.	oil has a tendency to emulsify in the bowl	purifier will act as a clarifier at the discharge ring	oil will be lost through the water discharge ports	oil solids will be deposited only at the intermediate top disk	
14	3071	C	In large, low-speed, main propulsion diesel engines, piston ring groove wear usually occurs at the _____.	top of the ring groove	back of the ring groove	bottom of the ring groove	piston ring end clearance	
14	3072	D	Which of the following statements is true concerning the cylinder head and valve assembly of the diesel engine illustrated?	Both exhaust valves are oil cooled.	Dual sets of valve springs are used for each valve to reduce valve bounce.	Valve lash is mechanically adjusted at the top end of the push rod.	Both exhaust valves are opened simultaneously by the valve bridge.	See illustration number(s): MO-0013

14	3073	C	The device used to engage a diesel engine starting motor with the flywheel ring gear is the _____.	automatic follow-up mechanism	muff coupling and release mechanism	automatic pinion-shift (Bendix) mechanism	friction clutch mechanism	
14	3074	A	Which of the mechanical operations listed can be determined about the standby diesel engine shown in the illustration?	The camshaft rotates at one half the engine speed.	The cam follower for the fuel pump is located above the camshaft.	The fuel pump stroke is manually adjusted by rotating piece K.	The valve lash is mechanically adjusted by rotating piece E.	See illustration number(s): MO-0005
14	3081	C	A diesel engine cylinder head can crack as a result of _____.	a leaking seal ring	heat transfer from exhaust valves	restricted cooling passages	overheated intake valves	
14	3082	C	Which of the following statements is true concerning the standby diesel engine shown in the illustration?	The camshaft rotates at the same speed as the crankshaft.	Turbulence is provided by the air intake ports.	The valve spring shown is under slight compression.	The top piston rings are prevented from overheating by a heat dam.	See illustration number(s): MO-0007
14	3083	C	In the illustration, pieces #31 and #29, have 16 and 55 teeth respectively. In order to start the engine, the Bendix drive must turn 3000 RPM. Therefore, the air motor assembly must rotate at _____.	872.72 RPM	5516.3 RPM	10312.5 RPM	26400 RPM	See illustration number(s): MO-0044
14	3084	A	The use of push rods are necessary in a diesel engine when _____.	the camshaft is located some distance below the rocker arms	the rocker arms are pivoted near their centers	two or more valves must be opened and closed at the same time	hydraulic valve lash adjusters are used	
14	3085	A	If diesel fuel was discharging from the waste water outlet of a disk type centrifugal purifier operating as a separator you should _____.	reprime the purifier	remove the discharge ring	slow the purifier to its proper speed	put in an additional discharge ring	
14	3091	D	The ring lands on a large, low-speed, main propulsion diesel engine piston may crack due to _____.	insufficient cylinder liner wear	contaminated lubricating oil	high main lubricating oil system temperature	insufficient ring groove clearance	
14	3092	A	Which of the listed design features is found in an exhaust valve and NOT in an intake valve?	Hard alloy steel construction	Beveled edges on the valve head	Low alloy steel construction	Poppet type design	
14	3093	D	The Bendix drive on the starting motor illustrated is indicated by piece number _____.	30	45	52	53	See illustration number(s): MO-0044
14	3094	A	In an auxiliary diesel engine, the reason for knurling the piston skirt is to _____.	improve skirt lubrication	allow for expansion	transmit forces evenly	improve the piston seal	
14	3095	C	Which factor determines the ring dam size for a fuel oil, tubular bowl type, centrifugal purifier?	The viscosity of the fuel.	The quantity of water to be removed from the fuel.	The specific gravity of the fuel.	The quantity of dirt to be removed from the fuel.	
14	3101	D	Cracking of a diesel piston crown can result from _____.	excessive piston to liner clearance	the underside of the piston crown being excessively dirty, lowering the rate of heat transfer	faulty nozzle spray	all of the above	
14	3102	C	Many diesel engine exhaust valves are being constructed with hollow stems filled with sodium in order to _____.	provide added wear protection against today's corrosive quality of fuel	increase overall valve strength due to the high gas pressures	assist in dissipating heat due to the extreme operating temperatures	reduce the overall weight of the valve thus helping eliminate valve spring surge and hammering	
14	3103	A	Marine auxiliary diesel engine starters utilizing Bendix drive gear are powered by an electric starting motor or _____.	hydraulic starting motors	explosive cartridge motors	inertial flywheel motors	compound gear motors	
14	3104	A	Which type of wrist pin uses bearings in the piston bosses, but is fixed to the small end of the connecting rod?	Semi-floating	Full floating	Solid	Fixed	
14	3105	D	Poor quality fuel being used in a turbocharged medium-speed, diesel engine could result in _____.	hard starting	excessive fuel consumption	loss of power	all of the above	

14	3111	A	If clearance between a piston and the cylinder wall is excessive, piston slap will occur. The slap itself is caused by _____.	alternation of side thrust	a breakdown of the lube oil film on the cylinder wall	worn piston boss piston pin bearings	fluctuating gas pressure in the combustion space	
14	3112	A	A built-up exhaust valve is one in which _____.	the stem and heads are made of different material	low-alloy steel is used throughout	a replaceable valve disk is welded to the head	the self-centering action comes from motion of the valve stem in the guide	
14	3113	B	The diesel engine starting motor, shown in the illustration, utilizes which of the following types of drive/clutch mechanisms?	Bendix-drive	overrunning clutch drive	Dwyer-drive	single phase 110 volt induction	See illustration number(s): MO-0051
14	3114	D	Which of the following statements is correct concerning the connecting rod and piston assembly shown in the illustration?	The piston has a heat dam.	The piston pin is bolted to the connecting rod.	The piston is free to rotate on the carrier thrust washer.	All of the above.	See illustration number(s): MO-0011
14	3115	B	Brake specific fuel consumption is given in units of _____.	DEMA	lbs/bhp-hr	BTU/lb	PLAN	
14	3121	B	Which of the following statements concerning cylinder liner wear is true?	Liner wear is distributed equally between the upper and lower portions of the cylinder.	Excessive liner wear causes wear between piston ring and groove.	Excessive, but uniform liner wear will not cause wear between piston ring and groove.	Liner wear is normally greatest in the middle of the cylinder.	
14	3122	C	Valve rotators are commonly used on which of the listed diesel engine cylinder head valves?	Air starting	Cylinder relief	Exhaust	Blowdown	
14	3124	C	To reduce the weight of the reciprocating parts, pistons of high-speed engines are made considerably shorter. This results in _____.	less piston slap and quieter running	increased crankshaft bearing wear	slightly greater piston wear	decreased side pressures	
14	3125	D	When comparing different fuels for different engines, the ignition quality of diesel fuel oils becomes a less critical consideration as _____.	the amount of lube oil additives increase	piston speeds increase	injection pressures decrease	engine speeds decrease	
14	3131	C	Scuffed cylinder liner surfaces in a diesel engine can result from _____.	starting the engine hot	knurling the piston skirt	operating an overheated engine	using scuff resistant piston rings	
14	3133	D	The pinion of an electric starting motor used with a diesel engine engages the flywheel ring gear by a/an _____.	automatic follow-up	muff coupling and release	friction-type clutch	Bendix drive or similar mechanism	
14	3135	C	The adverse effects of burning high sulfur fuel can be compensated for by using a cylinder oil having sufficient _____.	dispersant additives	floc point depressive additives	alkalinity	ignition quality	
14	3141	C	Wear is usually greatest at the top of the cylinder bore of a diesel engine due to the _____.	side thrust	skirt making the greatest amount of contact	highest pressures being exerted	tremendous acceleration rate	
14	3142	D	A turbocharged, four-stroke/cycle diesel engine has a larger valve overlap than a naturally aspirated, four-stroke/cycle diesel engine in order to increase the _____.	temperature of the exhaust gases	energy supplied to the turbocharger	air pressure to the intake manifold	cooling effect on the exhaust valves	
14	3143	B	Electric starting motors for diesel engines require high current for operation and _____.	require a generator as a source of power	will carry a 100% overload for a brief period	require a current/voltage regulator for proper operation	will overheat if operated continuously over 10 seconds	
14	3144	B	Piston cooling fins are located _____.	atop the piston crown	beneath the piston crown	at the base of the piston skirt	inside the cylinder liner cooling water jacket	
14	3151	C	If the oil scraper ring drain hole in a diesel engine piston becomes plugged, _____.	blow-by will decrease	oil consumption will decrease	oil consumption will increase	the ring will immediately seize and buckle	

14	3152	B	The exhaust ports shown in the illustration are identified with the letter "____".	B	Q	T	U	See illustration number(s): MO-0003
14	3153	D	Auxiliary diesel engine electric starting motors use _____.	alternating current	400 cycle per second motor-generators	low amp, high voltage AC	direct current	
14	3154	B	Many cast iron pistons are designed with heat dams, which serve to _____.	keep piston crown temperatures elevated for smoother combustion	reduce the possibility of overheating the top compression ring	help retain the heat of compression to prevent ignition delay	help retain the heat of compression to prevent combustion knock	
14	3161	C	If the piston groove drain holes for the oil control rings become clogged, which of the following is likely to occur?	The oil control rings will seat improperly and wear rapidly.	The piston will overheat due to insufficient lubrication.	Excessive oil will remain on the cylinder wall.	Light brown smoke will emanate from the engine exhaust.	
14	3162	B	The size of the exhaust valve opening is _____.	most critical in a four-stroke/cycle diesel engine	most critical in a two-stroke/cycle diesel engine	most critical in a four-stroke/cycle diesel engine if it is turbocharged	of equal importance in a two-stroke/cycle diesel engine as in a four-stroke/cycle diesel engine	
14	3163	D	Diesel engine electric starting motors generally require heavier duty motors and operate at higher voltages than comparable starting motors for gasoline engines due to _____.	higher speed required	flywheel effect	lower starting temperatures	higher compression pressures	
14	3165	D	Heavy fuel oil used in the system show in the illustration, will have the lowest viscosity _____.	at the transfer pump discharge	in the settling tank	in the three-way valve	at the main engine fuel oil header	See illustration number(s): MO-0058
14	3171	B	If the compression rings on a diesel engine piston become stuck in the ring groove, the cause may be due to _____.	excessive ring action	excessive ring temperature	improper ring rotation	excessive ring face wear	
14	3172	C	Exhaust valve openings in a diesel engine cylinder head are made as large as practical to _____.	increase back pressure during the exhaust process	facilitate periodic replacement of the valves	reduce the pumping loss associated with scavenging	reduce tension on valve springs	
14	3173	D	Electric starting motors for diesel engines require high current for their operation. As a result of this, they _____.	have a generator as a source of power	need a current-voltage regulator for proper operation	will overheat if operated continuously over ten seconds	will carry a 100% overload for a brief period	
14	3174	A	Cold clearances between the skirt of an aluminum piston and the cylinder liner is about _____.	twice as large as with a cast iron piston	the same size as with a cast iron piston	half as large as with a cast iron piston	the same size as the crown of an aluminum piston	
14	3181	A	Improperly fitted piston rings in a diesel engine can cause _____.	excessive lube oil consumption	lower than normal lube oil temperature	higher than normal exhaust back pressure	excessive crankshaft end play	
14	3182	D	Exhaust gases are generally removed from the cylinders of a two-stroke/cycle diesel engine by _____.	natural aspiration	masked intake valves	air cells	scavenging air	
14	3183	B	When piloted by a small amount of control air, the pneumatic relay valves, shown in the illustration, will provide a large flow of air from a separate source. The flow will stop when the control pressure is vented through the port numbered _____.	9	10	11	12	See illustration number(s): MO-0052
14	3184	D	The part labeled "E", as shown in the illustration, is the _____.	bearing shell	connecting rod bushing	piston pin bushing	connecting rod cap	See illustration number(s): MO-0040
14	3191	D	Diesel engine piston seizure can be caused by _____.	poor cooling of cylinder walls	improper cooling of the piston	insufficient piston lubrication	all of the above	
14	3192	D	In the cylinder head of a two-stroke/cycle diesel engine, valves are used for _____.	air intake	a fuel outlet	cooling water inlets	exhausting combustion gas	
14	3193	B	A six-cylinder, two-stroke/cycle diesel engine is fitted with a rotary distributing air starting system. The speed of the rotating distributor disc is _____.	one-half engine speed	the same as engine speed	twice engine speed	four times engine speed	

14	3194	B	The part labeled "G", as shown in the illustration, is a _____.	bearing shell	connecting rod bushing	connecting rod cap	piston pin bushing	See illustration number(s): MO-0040
14	3201	A	Incomplete combustion in a running diesel engine can cause piston rings to become stuck as a result of _____.	residual carbon deposits	lube oil viscosity breakdown	uneven heat expansion of the rings	uneven heat expansion of the piston	
14	3202	D	The exhaust system for a turbocharged two-stroke/cycle diesel engine functions to _____.	discharge exhaust gases and smoke	furnish energy to the turbocharger	reduce engine room noise	all of the above	
14	3204	B	One end of a diesel engine cylinder is sealed by the cylinder head and the other end by the _____.	crankcase	piston	cylinder liner	crank cheek	
14	3211	D	A sudden drop in compression pressure in one cylinder of a diesel engine can be caused by _____.	a leaking fuel injector nozzle	a clogged air filter	excessively early fuel injection	malfunctioning valves	
14	3212	D	The most common instrument used to measure diesel engine exhaust pressure is the _____.	pyrometer	bourdon gauge	pneumercator	manometer	
14	3213	B	In the main engine starting control air distributor shown in the illustration, the roller of the starting control valve (3) is in contact with the base circle of the starting cam (5). At this control valve position, the "valve opening pipe (J)" is connected to the "discharge space (D)" and the "valve closing pipe (H)" with that of the "distribution space (F)." The result of this arrangement is that the _____.	vertical drive shaft (1) changes the direction of rotation	starting air stops flowing to the respective cylinder	starting control valve (3) will immediately pull back from the cam	discharge line (E) will begin to get hot	See illustration number(s): MO-0053
14	3214	A	In a two-stroke/cycle, opposed piston, diesel engine, one crankshaft operates several crank angles in advance of the other crankshaft to _____.	allow the exhaust ports to open and close before the inlet ports close	allow the scavenge ports to open and close simultaneously with the exhaust ports	prevent scavenge air pressure buildup in the cylinders	prevent the exhaust piston from reaching TDC and BDC before the intake piston	
14	3221	C	Low compression in a diesel engine could be caused by _____.	worn or broken cylinder liner sealing rings	high cooling water temperature	worn or broken piston rings	low fuel oil pressure	
14	3222	B	When monitoring diesel engine performance, the most useful instrument to use is the _____.	dwell-tachometer	exhaust gas pyrometer	fuel flow rate meter	exhaust gas analyzer	
14	3223	C	Which of the following statements is true concerning the air starting system shown in the illustration?	During starting, the starting valve is held opened by air pressure.	When starting air is secured, the air starting valve is closed.	The starting air valve is opened by cam action during starting.	During normal engine running, the starting air valve opens and closes constantly due to cam action.	See illustration number(s): MO-0046
14	3224	B	The difference in crank lead between the upper and lower cranks of an opposed piston engine causes the lower crankshaft to _____.	receive less power than the upper shaft	receive more power than the upper shaft	operate the fuel oil booster pump	rotate faster than the upper shaft	
14	3225	D	In an opposed piston engine, which of the following events would happen if the lower crank lead were reduced from 12, to 0,?	The exhaust ports would open before the scavenging ports.	The scavenging ports would open before the exhaust ports.	Neither the exhaust nor the scavenging ports would open.	The exhaust and scavenging ports would open simultaneously.	
14	3231	A	Worn main bearings in a diesel engine can result in _____.	decreased compression pressure	increased lube oil pressure	lower lube oil temperature	excessive leakage past the piston rings	
14	3232	C	A pyrometer is an instrument commonly used to measure _____.	cylinder pressure	flame intensity	exhaust gas temperature	crankshaft axial alignment	
14	3233	A	Which of the following statements describes the operational characteristics of figure "B" shown in the illustration?	The valve will lift abruptly, and reseat gradually.	Full valve opening will occur slowly, but reseat quickly.	Full valve opening will occur slowly, but abruptly reseat.	The valve gear will not bounce.	See illustration number(s): MO-0045
14	3234	A	During the power stroke of a four-stroke/cycle diesel engine, most of the side thrust of a trunk-type piston is absorbed by the _____.	piston skirt	pinion	crosshead	compression rings	
14	3241	A	Low compression pressure in a diesel engine can be caused by _____.	improperly seating intake valves	leaking cylinder liner seal rings	late fuel injection timing	carbon deposits on the piston	

14	3242	A	A pyrometer is an instrument used to measure the temperature of the diesel engine _____.	exhaust	fuel oil	cooling water	cylinder liner	
14	3243	C	Which of the following statements best represents how the starting valve, shown in the illustration, is opened to admit starting air to the main engine cylinder?	The valve spring exerts downward force on the valve spindle.	Air pressure from the starting air inlet is applied to the top of the starting valve piston.	Control air pressure is applied to the top of the starting valve piston.	The downward intake stroke of the main engine cylinder draws the starting valve open.	See illustration number(s): MO-0054
14	3251	B	Low compression pressure in a diesel engine is caused by _____.	low water in the expansion tank	improperly seated valves	low fuel oil pressure	worn or broken cylinder liner sealing rings	
14	3252	C	Thermocouple pyrometers are used on large, main propulsion diesel engines to indicate the temperature of the _____.	cooling water leaving each cylinder	fuel oil entering the injector	exhaust gases at various locations	lube oil at the bearing supplies	
14	3253	B	The admission valve, shown in the illustration, is fitted to an air supply manifold for opening and closing off the supply of compressed air to the starting valves, as well as air distribution to the main propulsion diesel engine. The admission valve is opened by _____.	vacuum on the control valve outlet	control air pressure on the guide piston acting downward on the valve piston	spring tension on the valve piston with a momentary interruption of reservoir air	venting the starting system air distribution	See illustration number(s): MO-0055
14	3254	B	A connecting rod in a four-stroke/cycle diesel engine is subject to _____.	tension load twice each crankshaft revolution	compression load during power and compression strokes	inertia load once every four crankshaft revolutions	bending loads at bottom and top dead center	
14	3261	D	Low compression pressure in a diesel engine can be caused by _____.	carbon deposits in the combustion space	carbon deposits on the piston crown	leaking cylinder liner seal rings	a leaking cylinder head gasket	
14	3262	A	Exhaust gas pyrometers are useful for _____.	detecting faulty combustion in individual cylinders	adjusting fuel racks to maintain equal loading between cylinders	adjusting the load limit setting of the governor at idle conditions	calculating engine horsepower	
14	3263	B	When the quick acting valve to admit starting air to an air start motor is activated, the valve should be opened rapidly to _____.	prevent damage to the air line lubricator	ensure proper operation of the Bendix pinion	prevent damage to the valve seat	increase the air charge density to the motor	
14	3271	B	Low compression pressure in a diesel engine may be the result of _____.	insufficient fuel supply due to fuel pump valves sticking or leaking	excessive mechanical clearance between the piston crown and cylinder head	excessively worn fuel pump plunger	excessive exhaust back pressure	
14	3272	C	For a diesel engine, individual cylinder performance is commonly determined by exhaust gas _____.	chemical analysis	back pressure readings	pyrometer readings	infrared analysis	
14	3273	C	Diesel engine air start system check valves are opened by _____.	an air start cam	cylinder compression pressure	starting air pressure	valve springs	
14	3274	A	In a four-stroke/cycle diesel engine the intake valves open _____.	before TDC and close after BDC	after TDC and close after BDC	before TDC and close before BDC	after TDC and close before BDC	
14	3281	B	Low compression in a diesel engine can be caused by _____.	clogged coolant passages	a leaking cylinder head gasket	low fuel oil pressure	worn or broken cylinder liner sealing rings	
14	3282	C	Pyrometers commonly found on diesel engine exhaust systems, consist of _____.	pyrostats and a voltmeter	a gas-filled bellows, a tube and a pressure gauge	thermocouples and a voltmeter	ammeters and thermocouples	
14	3283	B	In a direct cylinder admission air starting system, once the engine begins to fire, the air starting check valve illustrated, is closed by _____.	the starting air pressure	the spring force	a valve actuating cam	a pneumatic bellows assembly	See illustration number(s): MO-0107
14	3284	A	Excessive valve lash in an auxiliary diesel engine will cause the valves to open _____.	later and close sooner	sooner and close later	sooner and close sooner	later and close later	
14	3291	A	The loss of the diesel engine cylinder air charge through leaky valves, piston rings, worn or scored liners, would be indicated by which of the following sets of conditions?	Low compression pressure and high exhaust temperature	Low firing pressure and high exhaust temperature	Low compression pressure and low exhaust temperature	Low firing pressure and low exhaust temperature	

14	3292	D	Which of the general advantages listed does the electrical pyrometer have over the mechanical pyrometer?	When heated, it will move proportional to the amount the metal has lengthened or expanded.	The pointer associated with the pyrometer scale can be made to also measure engine RPM.	It can be utilized in exhaust manifolds and heat exchangers interchangeably.	It can indicate temperature at a distant point from the source of heat.	
14	3293	C	When an air started, four-stroke/cycle diesel engine is being cranked, the starting air is admitted to each cylinder during what would normally be the _____.	intake stroke	compression stroke	power stroke	exhaust stroke	
14	3301	D	Which of the listed problems can be a cause of low compression pressure in a diesel engine?	Clogged air filter	Leaky valve cage	Burned exhaust valves	All of the above	
14	3302	C	Which of the diesel engine exhaust mufflers listed is usually equipped with a spark arrestor?	A wet-type exhaust muffler	A constant pressure muffler	A dry-type exhaust muffler	A constant velocity muffler	
14	3304	B	When the cold valve lash is less than that specified by the manufacturer, diesel engine valves, operating at normal temperatures, will _____.	open later than normal	close later than normal	have less total lift	have less total duration	
14	3311	B	Low cylinder compression pressure and a high exhaust temperature may indicate _____.	early fuel injection timing	leaking valves	a continuously open scavenge air port	low cooling water temperature	
14	3312	B	A dry-type spark arrestor removes sparks from a diesel engine exhaust by _____.	increasing the linear velocity of the exhaust gases	changing directions of exhaust gas flow	decreasing the temperature of the exhaust gases	accelerating the exhaust gas through a reduced size orifice	
14	3313	A	If a four-stroke/cycle diesel engine is started by injecting air into the cylinders, the pistons receiving the charge of starting air must be _____.	on the power stroke	on the exhaust stroke	at the end of the power stroke	at the start of the intake stroke	
14	3314	C	If the valve lash on a diesel engine is set improperly, which of the following statements represents the most serious problem that can develop?	Too little lash will cause noisy operation and excessive wear.	Too much lash will cause the valve to open early and close late.	Too little lash may prevent the valves from seating properly.	Too much lash may prevent combustion through loss of compression.	
14	3321	D	A drop in compression pressure in one cylinder of a diesel engine can be caused by _____.	a leaking fuel injection nozzle	a clogged air filter	early fuel injection	burned valves	
14	3323	D	In a medium-speed marine propulsion engine equipped with direct air starting valves, the cylinders without air starting valves fire first because the _____.	operation is under higher compression	fuel is admitted only to these cylinders during cranking	compression is released during starting by opening the exhaust valve	cylinders are not chilled by the expansion of the starting air	
14	3324	A	If you increase the clearance between a valve stem and rocker arm, which of the listed conditions will occur?	Valve will open later.	Valve will close later.	Amount of fuel injected will be increased.	Amount of fuel injected will be decreased.	
14	3332	C	Wet-type exhaust silencers, used with some diesel engines, have which of the following design features in common?	The silencer is equipped with a water seal.	The exhaust gases are not mixed with cooling water.	The internal baffles break up the exhaust gas pulsation.	The exhaust noise is completely eliminated.	
14	3333	C	An eight cylinder, air started, two-stroke/cycle direct reversing, marine diesel engine can be started from any crankshaft position only if it has _____.	each upper cylinder head equipped with reversible air start valves	a minimum of five cylinders equipped with air start valves	at least three cylinders equipped with air start valves	the cylinders on opposite ends equipped with air start valves	
14	3334	B	Reducing the clearance between a valve stem and rocker arm will result in the valve _____.	having a shorter duration of opening	having a longer duration of opening	closing sooner	opening later	
14	3341	B	Which of the listed conditions can cause lacquer to be deposited on a piston skirt?	High sulphur content fuel	High lube oil temperatures	High vanadium content fuel	Excessive piston slap	
14	3342	C	In accordance with Coast Guard Regulations (46 CFR) regarding internal combustion engine exhaust manifold installations, which of the following statements is true?	They must be fitted with a backfire flame arrester constructed in accordance with the specification regulations.	They cannot be located any closer than six inches from flammable materials such as woodwork, etc.	They may be water-jacketed and cooled by the discharge from a pump which operates only when the engine is running.	They must be fitted with one inch thick asbestos board and covered with #26 USSG galvanized sheet iron.	

14	3343	B	A large two-stroke/cycle direct reversing diesel engine is to be reversed. Prior to the admission of starting air you must _____.	line up the engine for restarting with light diesel oil	reposition the fuel injection cam	change the intake and exhaust valve cam positions	place the starting cam in the intermediate position	
14	3344	D	The procedure of adjusting the valve clearance in the valve mechanism illustrated is by _____.	mechanically adjusting the valve at point "D"	mechanically adjusting the valve at point "E"	changing the tappet clearance as measured between points "A" and "B"	measuring the cold valve clearance between components "C" and "D"	See illustration number(s): MO-0074
14	3350	B	Which operating condition of a diesel engine is indicated by excessive firing pressures?	Overspeeding	Overload	Low exhaust temperature	High crankcase pressure	
14	3351	A	In a diesel engine, after ignition of the fuel occurs, but before the piston reaches TDC, there is little change in the cylinder _____.	volume	pressure	temperature	energy	
14	3352	A	Coast Guard regulations (46 CFR) require a horizontal dry exhaust pipe from a diesel engine must _____.	terminate above the deepest load waterline	be equipped with a water-cooled muffler	have adequate insulation in any berthing space	not penetrate the engine room casing	
14	3353	A	Which of the routine maintenance procedures listed is required for starting air receivers?	Frequent draining of accumulated moisture.	Frequent testing of relief valves.	A close watch on temperature to prevent fluctuations in pressure.	Frequent cleaning to remove oil and foreign matter.	
14	3354	D	If you were inspecting the valve springs on an auxiliary diesel engine, your best indication of impending spring failure would be _____.	a glazed surface on the spring	nicks in the protective coating	a buildup of sludge deposits	cracks in the surface of the spring	
14	3361	B	Which of the conditions listed could cause the cylinder relief valves on a large, low-speed, propulsion diesel engine to lift?	Plugged injector nozzles	Excessive fuel injection	Very late injection timing	Incorrect crankshaft clearances	
14	3362	D	The exhaust system of a diesel engine is usually designed to remove exhaust gases and to _____.	provide exhaust back pressure	prevent exhaust smoke emissions	power a reciprocating supercharger	muffle exhaust gas noise	
14	3363	B	When the solenoid of a Bendix drive type starter is energized by operating the starter switch, the _____.	plunger draws the flywheel ring gear into the drive position	plunger completes the circuit between the battery bank and starting motor	friction clutch causes the pinion to rotate into the starting position	control windings de-energize and force the plunger out	
14	3364	A	Worn cylinder head valve seats in a diesel engine will cause _____.	less cold valve lash	more cold valve lash	excessive pressure in hydraulic valve lash adjusters	broken valve springs	
14	3371	C	Which of the following reasons represents why the designed compression ratio of a gasoline engine is lower than that of a diesel engine?	Compression must be low for effective spark ignition.	Compression must be low for required horsepower and torque generation.	Compression must be low to prevent preignition.	Compression must be low to have effective preignition.	
14	3372	D	The diesel engine shown in the illustration, the exhaust manifold is indicated by the letter _____.	A	B	P	U	See illustration number(s): MO-0003
14	3373	C	In some Bendix drive electric starting systems, the sudden shock of the pinion gear being engaged with the flywheel is absorbed by the _____.	action of the overrunning clutch	pinion when it engages the ring gear	action of the friction clutch	action of the starter solenoid	
14	3374	B	Which of the following operations will have a direct impact on the rate of wear in a cylinder liner _____.	amount of scavenge air to the cylinder	quality of fuel injected	viscosity of the lube oil	compression ratio of the piston	
14	3381	A	If the relief valve on a diesel engine cylinder lifts, the cause could be due to _____.	liquid in the cylinder	low compression in the cylinder	high exhaust temperature	poor fuel penetration	
14	3382	C	Which of the listed characteristics is common to both wet and dry type diesel engine exhaust mufflers?	Both mufflers contain moving parts.	They never require any maintenance.	They function as spark arresters.	Both have a dust collecting chamber.	
14	3384	D	Scuffed cylinder liner wearing surfaces in a diesel engine can result from _____.	chromium plating piston rings	knurling the piston skirt	extended maximum power operation	applying load to a cold diesel engine	
14	3391	B	An increase in crankcase pressure generally indicates _____.	worn connecting rod bearings	worn engine cylinder liners	high cylinder firing pressure	stuck spring-loaded manhole covers	

14	3392	C	Exhaust pipes for separate diesel engines can be combined only when _____.	space limitations prevent separately run pipes	the engines are small auxiliary units	they are arranged to prevent gas backflow to each engine	a waste heat boiler is installed	
14	3394	C	Scuffed cylinder liner wearing surfaces in a diesel engine can result from _____.	starting the engine while hot	knurling the piston skirt	operating the engine overheated	scuff resistant piston rings	
14	3401	C	A substantial increase in crankcase pressure could be an indication of _____.	excessive lube oil pressure	the proper seating of new rings	a worn cylinder liner	a malfunctioning cylinder relief valve	
14	3402	C	Marine diesel engine dry-type mufflers reduce noise by _____.	using phase adjusters	decreasing back pressure at the exhaust manifold	allowing gases to expand and change direction of flow	constant pulse charging at the exhaust manifold	
14	3403	A	Which of the following operating characteristics of the Bendix drive friction clutch is associated with a Bendix drive starter?	Helps absorb the shock when the pinion engages the ring gear.	Disengages the pinion from the flywheel ring gear.	Engages the pinion with the flywheel ring gear.	Prevents the pinion starter from overrunning on the starter shaft.	
14	3404	D	You are inspecting the lower main precision bearings on a diesel engine. You observe that about half the thin babbitt linings are of a milky white color. This condition is caused by _____.	large dirt particles in the oil supply	insufficient lubricating oil and overheating	normal wear	water contamination of the lube oil	
14	3411	D	An increase in diesel engine crankcase pressure generally indicates excessive _____.	compression pressure	lube oil header pressure	scavenge air pressure	piston ring blow-by	
14	3412	A	A water jacket is placed around the exhaust manifolds of propulsion diesel engines to _____.	reduce heat radiation to the engine room	aid in preventing turbocharger overheating	condense and drain moisture from exhaust gases	dampen exhaust gas pulsations in the manifold	
14	3413	A	For a diesel engine, which of the following time increments represents the longest period the electric starter motor may be operated continuously?	30 seconds	45 to 60 seconds	60 to 75 seconds	75 to 90 seconds	
14	3414	B	Bearing clearances in small high-speed diesel engines should be measured using _____.	gage blocks	plasti-gage	feeler gages	round solder wire	
14	3421	A	A substantial increase in crankcase pressure could be an indication of a/an _____.	worn cylinder liner	faulty cylinder relief valve	excessive lube oil pressure	excessive scavenge air pressure	
14	3422	D	Diesel engine mufflers reduce noise by _____.	packing muffler chambers	the use of long head pipes	the use of zinc electrodes	changing exhaust gas direction	
14	3423	C	The accumulator shown in the illustration is pressurized by _____.	pump "F" only	pump "H" only	either pump "F" or pump "H"	neither pump "F" nor pump "H"	See illustration number(s): MO-0049
14	3424	D	When a piston is removed from a diesel engine for maintenance, the piston should be examined for _____.	scoring	cracks and burned spots	gummy deposits and sticking rings	all of the above	
14	3431	C	If a diesel engine were running at 20% overload with a smoky exhaust, you should _____.	stop the engine immediately to prevent damage	increase lube oil pressure	slow the engine allowing it to gradually cool	decrease the cooling water temperature to the water jacket	
14	3432	D	Diesel engine mufflers or silencers reduce the engine exhaust noise by _____.	passing the exhaust through long head pipes	diffusing exhaust vibrations through activated carbon baffles	increasing the exhaust gas velocity	reducing the exhaust gas velocity	
14	3433	A	The hydraulic starting motor is operated by hydraulic fluid flow under pressure from the _____.	accumulator	hand pump	engine-driven pump	reservoir	
14	3434	A	Failure to remove the carbon ridge from the top of the cylinder when replacing the piston rings, will result in _____.	damaged upper piston rings and/or ring lands	scored piston walls	damaged cylinder liners	deformed piston skirts	
14	3441	D	The most practical way of detecting an overload in one cylinder of an operating large, low-speed, main propulsion diesel engine is to _____.	check the cylinder exhausts for black smoke	listen for combustion knock in that cylinder	isolate each cylinder and inspect the injector	check the cylinder exhaust temperature frequently	

14	3443	A	The purpose of the engine-driven hydraulic pump in a diesel engine hydraulic starting system is to _____.	maintain pressure in the accumulator	engage the starter motor with the flywheel	fill the reservoir and prevent low level in the system	bypass the hydraulic motor when the engine is running	
14	3444	C	To reduce load during jacking operations, which of the listed devices should be opened?	Fuel line	Expansion tank	Cylinder test valves	Sea valve	
14	3451	B	An indication of an overloaded main propulsion diesel engine is _____.	white smoke in the exhaust	high exhaust gas pyrometer readings	sparks in the exhaust	blue smoke in the exhaust	
14	3452	A	Diesel engine mufflers accomplish noise reduction by _____.	reducing exhaust gas velocity	increasing the frequency of gas vibration	the use of long head pipes	the use of zinc electrodes	
14	3453	C	As soon as a diesel engine has started, which of the listed engine operating parameters should be checked FIRST?	Exhaust temperatures	Raw water pressure	Lube oil pressure	Air box pressure	
14	3454	C	When a diesel engine compression pressure is checked, the indicator is connected to the _____.	cylinder exhaust ports	injection line	cylinder indicator cock	banjo oiler line	
14	3461	B	In a diesel engine exhaust system, the cooling of the exhaust gases below their dew point, will result in _____.	increased engine back pressure	sulfuric acid corrosion	surface pitting of the turbocharger compressor blades	moisture impingement on the turbocharger compressor blading	
14	3462	D	The exhaust system for a diesel engine is usually designed to remove exhaust gases and to _____.	power the Roots-type exhauster	remove the emission of exhaust smoke pollutants	power a reciprocating supercharger	muffle exhaust noise	
14	3463	C	The starter control valve in the hydraulic system shown in the illustration is malfunctioning. Before removing the valve, you must first _____.	drain the reservoir	remove all plugs from the system	bleed off all accumulator pressure	ensure that the accumulator piston is in the charged position	See illustration number(s): MO-0049
14	3464	C	The instrument shown in the illustration is used on a diesel engine to _____.	measure concentration of chromate in jacket water	measure exhaust gas pressure	take compression and firing readings	balance exhaust gas temperature readings	See illustration number(s): MO-0031
14	3471	C	Misfiring in a diesel engine at light loads can be caused by _____.	high lube oil temperature	low lube oil temperature	excessive cylinder cooling	high air injection pressure	
14	3472	A	Diesel engine exhaust noise can be reduced in an exhaust muffler by _____.	changing the direction of exhaust gas flow	increasing the exhaust gas velocity	changing the exhaust gas weight	increasing the exhaust gas static pressure	
14	3473	D	Before any diesel engine hydraulic starting system is opened for servicing or repair, you must _____.	place all control levers in the "HOLD" position	ensure that the hydraulic fluid reservoir is full	block all hydraulic hoses using high pressure covers	bleed off all hydraulic pressure from the system	
14	3474	C	An auxiliary diesel engine may fail to start due to _____.	low exhaust back pressure	high lube oil temperature	insufficient cranking speed	excessive fuel atomization	
14	3481	B	A condition contributing to diesel engine piston rings sticking in the ring grooves, is insufficient ring clearance at the ring _____.	gap	side	back	radial	
14	3482	C	One of the purposes for water cooling the exhaust manifold in marine diesel engine is to _____.	reduce lube oil temperature	raise exhaust temperature	reduce excessive heating of engine room	reduce load on cooling water pump	
14	3484	B	If a diesel engine driving a generator turns over freely but fails to fire properly, the cause could be _____.	excessive compression pressure	air in the fuel lines	high fuel pressure	excessive load	
14	3490	C	In a two-stroke/cycle diesel engine, the exhaust gases are expelled from the cylinder by the _____.	exhaust manifold	valve bridge	pressure of the fresh air charge	valve adjusting gear	
14	3491	C	When the normal compression ratio of a diesel engine is not very high, misfiring at light loads may be caused by _____.	overloading the engine	low exhaust valve lift	excessive cylinder cooling	insufficient mechanical clearance	
14	3492	B	If the jacket water temperature rises rapidly above normal in a diesel engine, you should FIRST _____.	call the chief engineer	reduce engine load	check thermostatic valve	clean sea water strainer	

14	3493	D	The air start timing in the system shown in the illustration can be advanced by _____.	tightening spring II	loosening spring II	shortening stem III	lengthening stem III	See illustration number(s): MO-0046
14	3494	C	In an opposed piston engine, the term "crank lead" refers to _____.	one crankshaft turning faster than the other	the two crankshafts turning in different directions	the piston in one cylinder reaching inner dead center several crankshaft degrees before the other piston	the piston in one cylinder reaching dead center when the other reaches outer dead center	
14	3501	C	Which of the listed diesel engine systems is likely to create the problem of a cylinder regularly misfiring?	Lubrication	Cooling	Fuel	Electric ignition	
14	3502	A	During the valve overlap period, the exhaust pressure of a turbocharged, four-stroke/cycle diesel engine must be less than the intake manifold pressure to ensure _____.	effective cylinder scavenging and cooling	constant pressure from the turbochargers	cooler operation of the exhaust system	effective constant pressure for turbocharger operation	
14	3504	C	Which of the listed conditions will result in the failure of an auxiliary diesel engine to shut down?	Supplying high temperature inlet air.	Maintaining a high exhaust back pressure.	Lube oil entering in the air intake manifold.	Carbon buildup on the overspeed pawl.	
14	3506	A	The turbocharger diffuser shown in the illustration, is indicated by the part labeled _____.	"D"	"E"	"F"	"G"	See illustration number(s): MO-0080
14	3511	C	The instrument shown in the illustration would be used on a diesel engine to _____.	measure exhaust manifold pressure	measure air intake manifold pressure	take compression and firing readings	measure turbocharger torque	See illustration number(s): MO-0031
14	3513	A	Which of the following problems can occur if you continually fail to drain off condensate from a starting air receiver?	Corrosion and eventual failure of the tank.	Gumming of the tank relief valves.	Immediate failure of components downstream of the compressed air system.	Boiling of the water oil mixture as pressure is reduced.	
14	3514	C	If a diesel engine continues to run after attempting to shut it down, the probable cause is _____.	incandescent carbon particles	air remaining in the cylinders	lube oil leakage into the air intake system	a broken turbocharger valve	
14	3516	A	Regarding the turbocharger shown in the illustration, the diffuser section is indicated by the letter _____.	D	F	H	N	See illustration number(s): MO-0080
14	3521	A	A diesel engine experiences a sudden loss in speed, accompanied by black exhaust smoke, with the fuel rack at maximum, and the speed remaining below normal. The probable cause is _____.	engine overload	leaky valves	stuck or broken piston rings	low air injection pressure	
14	3522	D	From the engine data shown in the illustration, if the temperature of every cylinder was 870°F + or - 5°F, you would expect the exhaust temperature at the turbocharger inlet to be _____.	830°F + or - 5°F	850°F + or - 5°F	870°F + or - 5°F	890°F + or - 5°F	See illustration number(s): MO-0004
14	3523	C	Which of the following conditions is most likely to occur if the electric starter motor pinion gear fails to disengage from the flywheel of a diesel engine after the engine has started?	Flywheel will be damaged	Engine will stop	Starting motor will dangerously overspeed	Combustion gases will enter the air starting system	
14	3524	C	If the auxiliary diesel engine will not shut down, the trouble could be _____.	high lube oil pressure	high firing pressure	lube oil leakage into the blower	high fuel oil pressure	
14	3526	C	Regarding the turbocharger shown in the illustration, the part labeled "B" would be attached to the _____.	exhaust manifold	silencer outlet	aftercooler inlet	nozzle ring	See illustration number(s): MO-0080
14	3530	A	Which of the listed items should be secured before performing any maintenance on a solenoid operated air start valve?	Electric power and starting air	Lube oil standby pump and control air	Hydraulic switch and engage jacking gear	Motor drain and pneumatic control system power	
14	3531	B	Bouncing of the valve gear in a diesel engine can be caused by _____.	prolonged high speed operation	spring surge	worn valve seats	excessively tightened spring retainers	

14	3532	D	The exhaust gases in a supercharged two-stroke/cycle diesel engine are expelled from the cylinder by _____.	pumping action of the piston	pressure of the fuel charge	vacuum developed in the manifold	pressure of the fresh air charge	
14	3533	D	A diesel engine cranks properly during starting but immediately stalls. Which of the following systems is most likely at fault?	Hydraulic starting	Electric starting	Ignition	Fuel	
14	3534	B	If an auxiliary diesel engine frequently stalls, the trouble may be caused by _____.	low exhaust back pressure	air in the fuel system	gasket blow-by or leakage	incorrect assembly of idler springs	
14	3536	B	Regarding the turbocharger shown in the illustration, the piece labeled "F" is a _____.	variable inlet guide vane	fixed blade	moving blade	silencer	See illustration number(s): MO-0080
14	3541	B	Spring surge in diesel engine valve springs can result in _____.	increasing effective spring force	bouncing of the valve gear	splitting of the valve keeper collars	failure of the valve to open	
14	3542	C	The satisfactory operation of diesel engine exhaust valves usually depends on _____.	the proper back pressure	the cooling water temperature	correct timing and proper seating	accurate metering and the exhaust temperature	
14	3543	C	A large low-speed main propulsion engine must be operated with one cylinder secured. When the engine was stopped, the affected cylinder ended in a position preventing the engine from being restarted. Which of the following actions should be taken to correct the situation?	Turn the shaft with the turning gear while applying starting air.	Increase starting air pressure by small amounts until the air pressure is high enough to crank the engine over.	Admit starting air in the direction opposite to the desired direction, then restart in the desired direction.	Open the indicator cocks on those cylinders on compression and apply increased starting air pressure.	
14	3544	A	An operating diesel engine that suddenly loses power, is due to a/an _____.	restricted turbocharger air intake	oil leak into the turbocharger	dribbling injector	low fuel viscosity	
14	3545	A	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 _____.	limit controls	flame safeguard controls	combustion controls	programming controls	
14	3546	B	In the turbocharger shown in the illustration, the muffler would be connected to the part labeled _____.	B	C	H	K	See illustration number(s): MO-0080
14	3551	C	If it becomes necessary to cutout an individual cylinder of a large, low-speed, main propulsion diesel engine, the fuel to that cylinder should be secured and its _____.	fuel pump should be removed and all connections blanked off	cylinder oil feed rate should be increased slightly above that used at normal sea speed	cylinder oil feed rate should be reduced	cylinder oil feed rate should be increased to the maximum flow capable of the metering pump	
14	3552	D	In the operating cycle of a four-stroke/cycle diesel engine, blowdown to exhaust manifold pressure must occur before the piston begins the exhaust stroke to avoid _____.	pressure losses	exhaust pulsations	excessive scavenging	pumping losses	
14	3553	A	If a diesel engine turned over freely but failed to start, the cause could be _____.	water in the fuel	cold lube oil	excessive starting air pressure	excessive fuel pressure	
14	3554	A	A four-stroke, cycle, turbocharged, 1000 horsepower diesel engine has been operating under load. The load suddenly increases, causing excessive black exhaust smoke, and a rapid rise in the lube oil temperature. In response to this condition, you should _____.	reduce load	check your exhaust	adjust cooling water temperature	increase lube oil flow	
14	3556	A	Which of the operating characteristics listed would apply to the turbocharger shown in the illustration?	The turbine operating speed is dependent on engine load.	The air is compressed in the air cleaner.	The compressor operating speed matches the engine operating speed.	Compressor power consumption varies directly as engine speed varies.	See illustration number(s): MO-0081
14	3561	D	Which of the following procedures should be carried out when a large, low-speed, diesel engine is operated with one cylinder secured?	Lubrication to the defective cylinder should be increased.	Cooling water temperature to the engine should be increased.	Only the turbocharger speed should be reduced.	Engine speed should be reduced.	

14	3563	A	A diesel engine could fail to start because of _____.	incorrect injection timing	low exhaust back pressure	floating exhaust valves	excessive cranking speed	
14	3564	C	Excessive vibration in an operating diesel generator may be caused by _____.	electrical overload	surging at governed RPM	loose engine mounting bolts	coolant leaking into the cylinder	
14	3566	C	The device shown in the illustration is commonly used to _____.	provide cooling water circulation through the engine	protect the crankcase from overpressure in event of explosion	utilize the flow of exhaust gases to supercharge the engine	provide air starting pressure	See illustration number(s): MO-0080
14	3571	D	A bronze bearing liner with a lead-tin flashing has a milky-white color over most of its surface and some areas of exposed bronze. The white coloring indicates _____.	proper break-in wear	improper break-in wear	relocation of the overlay flashing	water contamination of the lube oil system	
14	3572	D	In a diesel engine, with the valves set to specification, the shape of the cam determines the valve _____.	point of opening	speed of opening	lift from its seat	all of the above	
14	3573	C	If a diesel engine turned over at normal cranking speed but failed to start, the cause could be late fuel injection or _____.	excessive fuel pressure	high lube oil viscosity	inadequate fuel injection	excessive starting air pressure	
14	3574	D	Irregular engine speed in a diesel generator can be caused by _____.	high generator load	low fuel viscosity	high injection pressure	binding in the fuel control linkage	
14	3576	B	The impeller shown in the illustration is powered by _____.	air	exhaust gas	water	oil	See illustration number(s): MO-0080
14	3581	C	Water accumulation in the cylinder of a secured engine is an indication that the _____.	soft water pump was not secured along with the engine	jacket water thermostat has failed	cylinder liner may be cracked	raw water pump is overspeeding just prior to engine shutdown	
14	3582	B	Which of the following statements represents the function of the valve bridge and hydraulic lash adjuster assembly shown in the illustration?	The exhaust valves are opened by the action of the bridge spring.	The lash adjuster maintains zero lash between the valve stem and the bridge.	The ball check is always seated when the valve is closing.	The bridge spring keeps pressure between the plunger and the valve.	See illustration number(s): MO-0019
14	3583	D	When restarting a heavy fuel diesel engine that has been stopped for some time, the engineer should _____.	increase the starting air pressure	use a higher than normal cranking speed	increase the fuel injection pressure	use a fuel having a lower ignition temperature	
14	3584	C	If you notice smoke coming from the crankcase exhaust fan outlet of an operating diesel engine, you would suspect _____.	a cracked cylinder liner	clogged intake ports	broken piston rings	a faulty head gasket	
14	3586	D	In a main propulsion turbocharged diesel engine, the speed of the turbocharger varies according to the _____.	governor droop	speeder spring tension	fuel rack lag	load on the engine	
14	3591	D	If water is ejected from an open indicator cock when the engine is rotated by the turning motor, a leak may have occurred at the _____.	injector insert bushing	valve seat insert	cylinder liner	all of the above	See illustration number(s): MO-0032
14	3593	D	A four-stroke/cycle, 1000 horsepower diesel engine fails to start at normal cranking speed with normal fuel pressure and ambient temperature. The reason for the failure could be _____.	glazed liners or pistons	high lube oil pressure	excessive compression ratio	worn valve seats and valves	
14	3594	D	If a clicking sound is being produced from within the valve compartment of a diesel engine, the cause may be _____.	a loose valve stem and guide	excessive valve clearances	a stuck valve	all of the above	
14	3596	B	The operating speed of a turbocharger is directly dependent upon _____.	engine speed	engine load	intake manifold pressure	atmospheric pressure	
14	3601	D	The bore of a diesel engine describes the _____.	length of the piston rod	height of the piston	volume of the cylinder	diameter of the cylinder	

14	3602	D	Which of the listed construction characteristics is apparent of the diesel engine shown in the illustration?	The engine is equipped with a constant pressure turbocharger.	The engine operates on the two-stroke/cycle.	The engine is equipped with unit injectors.	Valve lash is mechanically adjusted.	See illustration number(s): MO-0005
14	3603	D	The starting air rotates a diesel engine at the proper speed, but the engine fails to start. You should check _____.	the overspeed trip	for an obstructed air filter	for air-bound fuel lines	all of the above	
14	3604	C	A loud clicking noise occurring from within the valve compartment of an operating diesel engine would indicate _____.	worn valve seats	tight rocker arm springs	excessive valve clearance	weak rocker arm springs	
14	3606	B	The speed of the turbocharger for a four-stroke/cycle diesel engine driving a generator at constant speed depends on the _____.	engine speed	kilowatt load	fuel injection pressure	air intake manifold temperature	
14	3611	D	The cubic inch (or liter) displacement of a cylinder is determined by the diameter of the piston and the _____.	length of the crankshaft	volume of the clearance space	weight of the piston	length of the stroke	
14	3612	B	The intake ports of a two-stroke/cycle diesel engine are opened and closed by the action of the _____.	camshaft	piston movement	exhaust valves	vertical drive	
14	3613	C	When attempting to start a main propulsion diesel engine, the engine turns at the proper speed but will not start. You should check the _____.	starting air pressure	scavenge air pressure	overspeed trip	banjo oiler line	
14	3614	A	If a valve seat insert, similar to the that shown in the illustration is cracked, this may be indicated by _____.	white vapor in the exhaust gas	high exhaust pyrometer readings on that particular cylinder	continuous spring surge	a jammed indicator cock	See illustration number(s): MO-0043
14	3616	B	At rated engine load and RPM, the diesel engine turbocharger is powered by _____.	belt drive	exhaust gases	electric motor	friction clutch	
14	3621	D	During the compression stroke in a four-stroke/cycle, diesel engine, assume that the piston can only travel seven-eighths of the total distance between BDC to the underside of the cylinder head. Which of the following ratios will be the compression ratio for this engine?	6 to 1	7 to 1	7.5 to 1	8 to 1	
14	3622	C	Exhaust gases in a two-stroke/cycle diesel engine are discharged through _____.	the air valves	a roots-type blower	exhaust ports or valves	direct to the atmosphere	
14	3623	D	If an auxiliary diesel engine equipped with an electric starting system cranks very slowly after repeated attempts to start, the cause could be a/an _____.	low lube oil viscosity	low compression pressure	ring gear with broken teeth	overheated motor windings	
14	3624	D	When checking the underside of the valve cover shown in the illustration, you find localized black patches. You should suspect _____.	worn valve locks	loose tapered collars	a damaged inner valve spring	worn exhaust valve guides and seals	See illustration number(s): MO-0043
14	3631	B	A turbocharged, eight cylinder, two-stroke/cycle diesel engine has a swept volume of 5160.31 cubic inches, a 9 1/16 inch bore, 10 inch stroke, and a compression ratio of 14.5:1. If during an overhaul, the cylinder heads have to be trued by milling off .024 inches, what will be the resultant swept volume and compression ratio?	5160.31 cubic inches; 14.92:1	5160.31 cubic inches; 14.95:1	6450.25 cubic inches; 14.97:1	6450.25 cubic inches; 14.99:1	
14	3632	A	The exhaust ports shown in the illustration are initially uncovered in figure _____.	#3	#4	#5	#6	See illustration number(s): MO-0025
14	3633	C	Which of the listed diesel engine starting systems is most susceptible to difficulties in cold weather?	Direct cylinder admission air start	Hydraulic	Electric	Air motor starting	
14	3634	B	The average pressure exerted on a piston during each power stroke is termed _____.	indicated horsepower	mean effective pressure	exhaust back pressure	compression pressure	
14	3636	B	If the speed of a turbocharged diesel engine is maintained constant as the load on the engine is increased, the speed of the turbocharger will _____.	decrease until the engine speed increases	increase	decrease	remain unchanged	

14	3641	B	(Piston area) X (Piston stroke) X (numbers of the cylinders) = engine _____.	brake horsepower	displacement	cylinder volume	cylinder clearance	
14	3642	C	Valves in the cylinder head of a diesel engine are opened by the direct action of the _____.	exhaust pressure	valve spring pressure	rocker arm movement	wrist pin movement	
14	3643	D	If a diesel engine, with an electric starter, cranks very slowly after repeated attempts to start, the cause could be _____.	low lube oil viscosity	low compression pressure	a faulty Bendix-drive	an overheated starting motor	
14	3644	C	Which of the listed conditions will affect the mean effective pressure the most in the cylinders of a diesel engine?	TBN of the lubricating oil	Temperature of the lube oil	Completeness in the mixing of the fuel and air	Temperature of the cooling (sea) water	
14	3646	D	An increase in power output of a turbocharged diesel engine operating at a constant engine speed results in _____.	higher exhaust temperature	increased turbocharger speed	higher air box pressure	All of the above are correct.	
14	3651	B	Engine displacement is equal to piston _____.	area times the piston stroke	area times the piston stroke times the number of cylinders	volume times the piston stoke	volume times the piston stroke times the number of cylinders	
14	3703	A	If cranking a diesel engine is too slow while attempting to start, it will result in _____.	insufficient heat of compression	fouling of the air intakes	improper injection timing	high exhaust temperatures	
14	3711	A	Most practical diesel engines today operate on a cycle which is a combination of the Diesel and Otto cycles. In this process, compression ignition _____.	begins on a constant volume basis	begins on a constant pressure basis	ends on a constant volume basis	begins and ends on a constant volume basis	
14	3712	B	The valve spring shown in the illustration, functions to _____.	prevent movement of the bushings	hold the valve against its seat	position the bushing to the cam	open the valve at the proper time	See illustration number(s): MO-0073
14	3713	B	If while attempting to start a diesel engine, the cranking speed is too low, _____.	the fuel timing will be too late	the heat of compression will be insufficient to ignite the fuel	the lube oil viscosity will be too low	the spark will be too early for the fuel	
14	3714	C	The engine shown in the illustration is a _____.	four-stroke/cycle on the exhaust stroke	two-stroke/cycle on the exhaust stroke	four-stroke/cycle on the intake stroke	two-stroke/cycle on the intake stroke	See illustration number(s): MO-0020
14	3721	D	In the theoretical diesel cycle, shown in the illustration, which of the listed conditions normally takes place between points "3" and "4"?	Compression	Combustion-constant volume	Combustion-constant pressure	Expansion	See illustration number(s): MO-0036
14	3722	A	The force exerted by a valve spring to close the diesel engine valves, is proportional to _____.	spring compression	engine speed	the natural frequency of vibration	spring surge	
14	3723	C	If a diesel engine rotates slowly when cranked, but does not fire, the _____.	fuel control rack had admitted excessive fuel	engine speed does not match the fuel rack setting	engine has failed to reach its firing speed	starter pinion and ring gear contact is not correct	
14	3724	B	If all other conditions such as bore, stroke, speed, and mean effective pressures are equal, a two-stroke/cycle diesel engine will develop approximately _____.	the same indicated horsepower as a four-stroke/cycle engine	twice the indicated horsepower as a four-stroke/cycle engine	one half the indicated horsepower as a four-stroke/cycle engine	one power stroke for every two crankshaft revolutions	
14	3731	C	In the pressure-volume diagram, shown in the illustration, the volume line is divided into 16 units indicating _____.	a cylinder volume of 166 cubic inches	16° of crankshaft motion between lines A and B	a 16 to 1 compression ratio	compression pressure is 1600 PSI	See illustration number(s): MO-0035
14	3733	A	A diesel engine may be hard to start if the _____.	air intake is restricted	engine is cranked too fast	vibration dampener is faulty	exhaust back pressure is low	
14	3734	C	A disadvantage of a four-stroke/cycle diesel engine is _____.	higher working temperature of piston and cylinder	the use of scavenge ports	fewer power strokes per revolution of the crankshaft	part of the fuel is burned as the piston is moving away from top dead center	
14	3741	A	In the pressure-volume diagram, shown in the illustration, what is indicated to have occurred by the line connecting points "d" and "e"?	The combustion gases have expanded.	The crankshaft has rotated 90°.	Pressure and volume have increased.	The fuel/air charge is compressed.	See illustration number(s): MO-0035

14	3742	C	The formation of carbon monoxide in diesel exhaust gases is reduced by _____.	spraying water into the exhaust pipe	keeping the exhaust system free of carbon deposits	maintaining proper combustion and scavenging	avoiding light load operation	
14	3743	D	Which of the listed failures, occurring in an automated diesel generator system, should cause an audible alarm at the engine room control station?	Low cooling water outlet temperature	High lube oil pressure	Low lube oil temperature	Low starting air pressure	
14	3744	B	Compared to four-stroke/cycle engines, two-stroke/cycle diesel engines have the disadvantage of _____.	less even torque	higher cylinder head temperatures	fewer power strokes per revolution	greater weight/size requirements	
14	3751	C	In the pressure-volume diagram, shown in the illustration, what occurs between points "e" and "f"?	The exhaust valve closes.	The intake ports close.	Pressure in the cylinder decreases.	Volume in the cylinder decreases.	See illustration number(s): MO-0035
14	3752	D	A large, low-speed, main propulsion diesel engine exhaust is designed to drain off _____.	rain water coming down the stack	seawater washing up exhaust pipes at the waterline	fuel oil due to leaky injector nozzles	condensed water vapor produced from the exhaust gases	
14	3753	A	Which of the following effects will excessively cold lube oil have on the operation of a diesel engine?	The engine will crank slowly and may fail to start.	The engine will overspeed when started.	The fuel oil supply will become diluted resulting in rough running.	The cooling system will overheat causing the engine to stall.	
14	3754	D	In comparing engines of equal horsepower, higher exhaust gas temperatures occur in a/an _____.	opposed-piston engine	double-acting engine	two-stroke/cycle engine	four-stroke/cycle engine	
14	3761	B	If point #1 in the ideal cycle diagram illustrated is the beginning of the compression stroke, which of the cycles listed is demonstrated?	Otto	Diesel	Dual or Sabathe	Rankine	See illustration number(s): MO-0036
14	3762	B	Decreasing the exhaust valve clearance of a diesel engine will cause the exhaust valve to open _____.	earlier and have less lift	earlier and remain open longer	later and have greater lift	later and have less duration	
14	3763	A	On a diesel engine with direct-cylinder admission air starting, a leaking air starting valve would be indicated by _____.	an overheated starting air supply pipe	excessive smoke from the engine exhaust	carbon deposit on the exhaust valves	early fuel ignition	
14	3861	D	A disadvantage of a two-stroke/cycle diesel engine is _____.	more power strokes per revolution	the use of scavenge air	more complicated valve gear	higher working temperatures of the piston and cylinder	
14	3862	B	A restricted diesel engine exhaust manifold operating under a normal load is indicated by _____.	low firing pressures and low exhaust temperatures	low firing pressures and high exhaust temperatures	high firing pressures and low exhaust temperatures	high firing pressures and high exhaust temperatures	
14	3863	A	What could be the cause of inadequate starting speed during the cranking of a cold diesel engine?	High lube oil viscosity	Low lube oil viscosity	Late fuel injection	Early fuel injection	
14	3871	A	In a single acting, two-stroke/cycle, diesel engine, the power impulse in an individual cylinder occurs _____.	once every crankshaft revolution	once every two crankshaft revolutions	once every piston stroke	twice every piston stroke	
14	3872	D	Excessive exhaust temperatures in a two-stroke/cycle diesel engine can be caused by a/an _____.	high injection pressure	high firing pressure	overheated air starting line	carbon build up in the exhaust ports	
14	3873	C	A diesel engine is turned at normal cranking speed and no ignition occurs. This could be the result of _____.	low lube oil temperature	low starting air temperature	air bubbles in the fuel oil system	water in the starting air system	
14	3874	B	High-speed, multi-cylinder, diesel engines commonly use counterweights placed opposite to the crankpins to _____.	prevent bearing loads	provide dynamic balance by equalizing centrifugal force	counteract inertia forces	provide a balance of rocking couples around the crankshaft	
14	3881	A	The #3 piston shown in the illustration, is on the _____.	intake stroke	exhaust stroke	compression stroke	power stroke	See illustration number(s): MO-0038
14	3882	B	A dry-type exhaust silencer clogged with soot, will cause _____.	low exhaust temperature	loss of engine power	burned intake valves	engine racing	
14	3883	C	A two-stroke/cycle diesel engine operates erratically, overspeeds, and fails to restart when cranked at normal speed. Which of the following problems is the most likely cause for the engine failing to restart?	Improper governor operation due to excess oil pressure	Damage to the governor due to excessive speed	Failure to reset the overspeed trip	Failure to reposition the fuel rack	

14	3884	A	If an auxiliary diesel engine will not crank but can be barred over, the trouble may be in the _____.	starting batteries	fuel injectors	fuel pump	engine governor	
14	3891	C	In the chart shown in the illustration, a right hand rotation engine has the #9 piston on top dead center; therefore, the #1 piston is on _____.	on the exhaust stroke	on the compression stroke	on the power stroke	at bottom dead center	See illustration number(s): MO-0039
14	3892	D	Clogged or partially obstructed exhaust ports on a diesel engine can cause _____.	overspeeding of the engine	failure of the engine to shut down	no effect of engine performance	high exhaust temperatures	
14	3893	C	A diesel engine fails to start, even though it can be barred over, but not cranked over. The probable cause is _____.	a seized piston	an improperly fitted bearing	a closed or obstructed air starting line valve	insufficient compression	
14	3894	D	If you observe smoke coming from the turbocharger of an auxiliary diesel engine, you should _____.	check the air filter for obstruction	check for an exhaust leak	check the exhaust temperature	secure the engine	
14	3901	C	Which of the following notations does the "N" represent in the formula shown below? IHP= PLAN/(33000)	Number of power strokes per revolution.	Number of revolutions per minute for both two-stroke and four-stroke engines.	Number of power strokes per minute.	Number of power strokes per second.	
14	3902	D	Partially obstructed exhaust ports on a diesel engine can cause _____.	overheating of the engine	high exhaust temperatures	sluggish engine operation	all of the above	
14	3903	C	When starting air is admitted, a diesel engine turns over very slowly without firing. The cause may be _____.	an obstruction in an engine cylinder	water accumulation in some engine cylinders	low starting air pressure	low scavenge air pressure	
14	3911	B	When the #1 piston, shown in the illustration, is at top dead center, the #9 piston is _____.	on the exhaust stroke	on the compression stroke	at top dead center	at bottom dead center	See illustration number(s): MO-0039
14	3912	A	An accumulation of carbon on one of its thermocouples of an exhaust gas pyrometer will _____.	read low for that location due to the insulation effect of the deposits	read high for that location due to the hot spots formed by the deposits	fluctuate due to the conductance of carbon	respond quickly to temperature changes	
14	3921	C	A piston is at bottom dead center when it is _____.	opening the exhaust ports	closing the fuel ports	farthest from the cylinder head	nearest to the cylinder head	
14	3922	B	If carbon accumulates on a pyrometer thermocouple, it will cause _____.	the pyrometer to overheat and burn	the pyrometer to read low	the exhaust passage to become clogged	failure of the hot junction	
14	3931	D	A piston is said to be at top dead center when it is _____.	opening the exhaust ports	closing the fuel ports	farthest from the cylinder head	nearest to the cylinder head	
14	4065	D	The diesel engine combustion chamber shown as figure "C" in the illustration is a/an _____.	stratified charge combustion chamber	precombustion chamber	turbulence chamber	open combustion chamber	See illustration number(s): MO-0068
14	4071	D	Using the information given in the illustrated table, which of the cylinders listed will fire next?	2	3	4	5	See illustration number(s): MO-0038
14	4072	D	Black smoke exhausting from a diesel engine may be caused by _____.	excessive scavenging air pressure	high coolant temperature	insufficient fuel	a clogged air cleaner	
14	4075	D	Open combustion chambers are designed to _____.	eliminate carbon buildup	improve piston cooling	prevent air charge turbulence	provide proper fuel/air mixing	
14	4081	C	The angular distance a flywheel rotates between the firing of the cylinders of a V-16, four-stroke/cycle diesel engine is _____.	22.50,	33.75,	45.00,	90.00,	
14	4082	B	Engine operating conditions may be indicated by the color of the exhaust smoke. Black smoke could indicate _____.	an insufficient speed droop setting	an overloaded engine	clogged drain holes in the oil control rings	complete combustion	
14	4085	D	The primary purpose of the open combustion chamber used in diesel engines is to _____.	improve piston cooling	stratify the fuel charge	prevent carbon buildup	provide a place for combustion	
14	4091	D	From the engine data given, after cylinder #1L fires, how many degrees of crankshaft rotation must take place before #4L cylinder fires?	22.5,	45,	67.5,	90,	See illustration number(s): MO-0004
14	4092	C	Black smoke exhausting from a diesel engine indicates _____.	proper fuel injection	water in the fuel	incomplete combustion	burning of lube oil	

14	4095	B	Many diesel engines have pistons with concave heads to _____.	decrease air turbulence and improve fuel mixing	increase air turbulence and improve fuel mixing	prevent fuel afterburning when injection ends	prolong fuel afterburning when injection ends	
14	4101	B	How many crank angle degrees of rotation exist between each firing of the cylinders indicated by the illustrated chart?	60,	120,	180,	240,	See illustration number(s): MO-0038
14	4102	B	What color exhaust will be exhibited when a slow speed two-stroke/cycle main propulsion diesel engine, designed to operate on light and heavy fuel oil, is operated on insufficiently preheated heavy fuel oil?	White	Black	Blue	Clear	
14	4105	C	Which of the following types of engines have a combustion chamber located between a cylinder head and the crown of a piston?	Horizontal opposed	Opposed	Single acting	None of the above	
14	4111	D	A four-stroke/cycle six cylinder in-line diesel engine has a firing order of 153624. When cylinder #6 is firing at top dead center, piston #4 is _____.	at top dead center	on the compression stroke	at bottom dead center	on the intake stroke	
14	4112	A	A dark exhaust from a running diesel engine can be caused by _____.	late ignition	water in the fuel	high compression temperature	starting valve stuck open	
14	4115	C	Turbulence in the combustion chamber of a diesel engine can be induced by _____.	delayed ignition	increased clearance volume	directional intake ports	multi-orificed fuel nozzles	
14	4120	C	In a single-acting diesel engine, the cylinder liner area that is most difficult to lubricate is the _____.	major thrust side	minor thrust side	top circumference	bottom circumference	
14	4121	B	When inspecting pistons, liners, and rings of a large two-stroke/cycle diesel engine through the cylinder ports, a wet piston crown would indicate a _____.	faulty piston lubricator	leaky fuel injector	broken compression ring	faulty oil ring	
14	4122	A	Which of the events listed does NOT occur during the instant the piston just reaches top dead center?	Intake	Ignition	Power	Combustion	
14	4125	A	The greatest turbulence in a diesel engine cylinder is created by the _____.	shape of the combustion chamber	fuel injection spray pattern	cylinder swept volume	degree of penetration of the fuel oil droplets	
14	4130	D	After removing an old set of rings, which of the following conditions is indicated if a bright spot is found on each end of a broken piston ring?	Improper lubrication	Excessive diametrical tension	Insufficient ring pressure	Insufficient gap clearance	
14	4131	A	In describing engine operation, what does the term "cycle" mean?	The sequence of events that produce a power pulse.	One rotation of the engine crankshaft.	One stroke of a piston.	All of the above.	
14	4262	A	High exhaust temperatures from all of the cylinders of a turbocharged, four-stroke/cycle diesel engine can be caused by an _____.	inoperative turbocharger	inadequate fuel supply	overload on one cylinder	unequal load distribution	
14	4272	B	In a multi-cylinder, constant pressure, turbocharged diesel engine, the combined exhaust temperature at the turbocharger inlet reads higher than the individual cylinder exhausts. This means the _____.	combined exhaust pyrometer is defective	combined exhaust pyrometer is reading normally	turbine blades are coated with carbon	turbine is overheating	
14	4372	C	You are operating a 16-cylinder diesel engine at 75% load, turning 900 RPM. All exhaust temperatures are between 900°F and 950°F, except the #3 cylinder, with an indicated reading of 750°F. All fuel rack settings are between 21 and 22 millimeters, with the exception of a 17 millimeter setting for the #3 cylinder. Which of the following corrections should be carried out?	Reduce engine load.	Stop the engine and change out the #3 fuel nozzle.	Increase the #3 rack setting and watch the exhaust temperature.	Stop the engine and adjust the #3 cylinder pump timing.	
14	4555	A	Combustion knock will most likely occur as a result of using a fuel with _____.	low ignition quality	a high volatility	low ignition delay	a high cetane number	

14	4764	C	Which of the following statements concerning the marine type reversing reduction gear set shown in the illustration is correct?	The gear illustrated is a reversing double reduction gear.	When operating astern, the ahead pinion is mechanically jogged out of mesh with bull gear.	Both ahead and astern clutch glands are driven by the engine.	The ahead and astern clutches engage their respective gear trains by sliding axially on the input shaft.	See illustration number(s): MO-0085
14	7411	C	When checking for the presence of sulfite in the feedwater of an auxiliary boiler, you are in essence checking _____.	the hardness of the makeup feed water	to ensure the compound additions are adequate for control of pH	to ensure the compound additions are adequate for controlling dissolved oxygen	to ensure the automatic or manual blowdown rate and frequency is adequate for control of total dissolved solids	
14	7758	A	If the load on a diesel engine equipped with an isochronous hydraulic governor is increased, after compensation is performed by the governor, the engine speed will _____.	remain the same	increase	decrease	fluctuate	
14	16872	A	Which of the listed fuel oil ignition methods are commonly found on automatically fired auxiliary boilers aboard merchant vessels?	A high energy electric spark	A gas pilot light	An incandescent glow plug	A manually-operated friction igniter	
14	30972	D	What method is used to supply air to the cylinders of the diesel engine illustrated?	Operation of the turbcharger at full load	Operation of an auxiliary blower at low load	The pumping action of the piston	All of the above are correct.	See illustration number(s): MO-0003
14	30999	B	The main source of fuel injection system malfunctions is _____.	improper adjustments	contaminated fuel	coated fuel lines	excessive vibration	
14	31035	D	The flash chamber attached to the auxiliary boiler illustrated, _____.	prevents flashing of feedwater in the system	regulates the eccentricity of the thermostat tube	preheats feedwater entering the boiler	permits heated boiler water to flash into steam	See illustration number(s): MO-0078
14	31197	C	To test the operation of the flame failure switch of an operating automatically fired auxiliary boiler, you should _____.	de-energize the high voltage ignition system	move the igniter away from the normal firing position	close the manual fuel valve with the burner firing	shift the controls to low fire	
14	31200	C	Which of the listed devices could be used as a ring groove cleaning tool during preparation for the installation of new rings?	Steel brush	Fine emery cloth or steel wool	A section of the removed compression ring	A case hardened scraper	
14	31201	C	On auxiliary boilers using individual flame scanners to monitor the main and pilot flames, the main flame scanner should be sighted to _____.	detect pilot flames that are incorrectly positioned	view the refractory directly opposite the main burner	avoid detecting the pilot flame	view the main flame in its outer periphery	
14	31220	D	The shape of a cam on a diesel engine determines the valve's _____.	point of opening	speed of opening	lift from its seat	All of the above are correct.	