

U.S.C.G. Merchant Marine Exam  
First Assistant Engineer  
Q515 Gas Turbine Plants  
(Sample Examination)

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

1. In the operation of a marine propulsion gas turbine, kinetic and thermal energy required to drive the main propeller shaft are extracted by the \_\_\_\_\_.

- (A) power turbine
- (B) COWL diffuser
- (C) multi-stage compressor
- (D) Variable Stator Vane actuators

*If choice A is selected set score to 1.*

2. In the marine gas turbine engine shown in the illustration, the HP turbine 2nd stage nozzle vanes are cooled by which of the following? Illustration GT-0020

- (A) Frame vent bleed air.
- (B) 9th stage compressor air.
- (C) 13th stage compressor air.
- (D) 16th stage compressor air.

*If choice C is selected set score to 1.*

3. In the marine gas turbine engine shown in the illustration, the 13th stage bleed air is used for \_\_\_\_\_. Illustration GT-0017

- (A) power turbine cooling
- (B) power turbine balance piston cavity pressurization
- (C) high-pressure turbine 2nd stage nozzle cooling
- (D) sump pressurization and cooling

*If choice C is selected set score to 1.*

4. As shown in the illustration, the HP turbine 2nd stage blades are cooled by convection, with the cooling air being discharged at which of the following? Illustration GT-0011

- (A) Trailing edge slots.
- (B) Nose holes on the leading edge.
- (C) Gill holes on the side.
- (D) Blade tips.

*If choice D is selected set score to 1.*

5. The gas generator section of the GE LM2500 gas turbine engine is composed of all of the following components EXCEPT for which of the following?

- ☐ (A) Two-stage HP turbine
- ☐ (B) FOD screen
- ☐ (C) Bellmouth
- ☒ (D) Six-stage LP turbine

*If choice D is selected set score to 1.*

6. The struts of the compressor front frame provide passages for all of the following mediums EXCEPT for which of the following?

- ☐ (A) Seal-pressurization air
- ☐ (B) Lube oil
- ☒ (C) Fuel oil
- ☐ (D) Scavenge oil

*If choice C is selected set score to 1.*

7. How is the HP turbine rotor of the GE LM2500 gas turbine engine cooled?

- ☐ (A) By an air to air heat exchanger
- ☐ (B) By the ship's service sea water cooling system
- ☐ (C) By synthetic lube oil
- ☒ (D) By a continuous flow of compressor discharge air

*If choice D is selected set score to 1.*

8. How many stages are in the HP turbine of the GE LM2500 gas turbine engine?

- ☐ (A) One
- ☒ (B) Two
- ☐ (C) Three
- ☐ (D) Four

*If choice B is selected set score to 1.*

9. A gas turbine that has a regenerator between the compression and combustion sections in which exhaust gas heat energy is added to the air charge is classified as what type of engine?

- ☒ (A) Semi-closed cycle engine.
- ☐ (B) Closed cycle engine.
- ☐ (C) Semi-open cycle engine.
- ☐ (D) Open cycle engine.

*If choice A is selected set score to 1.*

**10.** In a regenerative or recuperative gas turbine cycle configuration, the heat of the turbine exhaust gas is used to do what?

- ☐ (A) Heat the combustor discharge gas before entering the turbine.
- ☐ (B) Heat the LP compressor discharge air before entering the HP compressor inlet.
- ☒ (C) Heat the compressor discharge air before it enters the combustor.
- ☐ (D) Heat the intake air to the compressor.

*If choice C is selected set score to 1.*

**11.** For the same amount of available power, how does a low-speed two-stroke diesel engine compare to a recuperated gas turbine configuration?

- ☐ (A) The two-stroke diesel engine would burn more fuel and the particulate and nitrogen oxide (NOx) levels in the exhaust would be higher than that of a recuperated gas turbine configuration
- ☐ (B) The two-stroke diesel engine would burn more fuel than a recuperated gas turbine; however, the particulate and nitrogen oxide (NOx) levels in the exhaust would be lower.
- ☐ (C) The two-stroke diesel engine would burn less fuel and the nitrogen oxide (NOx) levels in the exhaust would be much lower than that of a recuperated gas turbine configuration.
- ☒ (D) The two-stroke diesel engine would burn less fuel than a recuperated gas turbine; however, the levels of particulate and nitrogen oxide (NOx) levels in the exhaust would be higher.

*If choice D is selected set score to 1.*

**12.** On a gas turbine engine, a high outside air temperature can cause high turbine inlet temperature, low mass/weight of air flow through the turbine, and which of the following conditions?

- ☒ (A) A requirement for more energy to achieve adequate compression
- ☐ (B) A requirement for less energy to achieve adequate compression
- ☐ (C) Cooler exhaust gas temperature
- ☐ (D) None of the above

*If choice A is selected set score to 1.*

**13.** Assuming that the turbine inlet temperature of a gas turbine engine remains constant, which of the following operating parameter changes would be noted with an increase in the compressor inlet air temperature?

- ☐ (A) The mass air flow through the gas turbine would increase.
- ☐ (B) The power turbine output increases due to hot inlet air requiring less fuel to be heated to the same turbine inlet temperature.
- ☐ (C) The exhaust temperature would drop significantly.
- ☒ (D) The gas turbine power would drop due to reduced mass air flow.

*If choice D is selected set score to 1.*

**14.** What is the designed compressor pressure ratio of the gas turbine compressor rotor shown in the illustration? Illustration GT-0004

- ☐ (A) 10 to 1
- ☐ (B) 12 to 1
- ☒ (C) 16 to 1
- ☐ (D) 20 to 1

*If choice C is selected set score to 1.*

**15.** The electrostatic vent fog precipitator removes oil mist from which of the following areas?

- ☒ (A) Main reduction gear
- ☐ (B) Synchronous self-shifting clutch
- ☐ (C) Gas turbine engine
- ☐ (D) Lube oil storage tank

*If choice A is selected set score to 1.*

**16.** Which of the following is true concerning the main engine lube oil system of the marine gas turbine shown in the illustration? Illustration GT-0024

- ☒ (A) The system includes a single combined lube oil supply and scavenge pump.
- ☐ (B) Lubrication is provided for the main reduction gears through the transfer gearbox.
- ☐ (C) The lineshaft bearing lubrication system is provided for by the LOSCA.
- ☐ (D) All of the above.

*If choice A is selected set score to 1.*

**17.** A gas turbine engine's main lube oil system pump check valve serves to maintain system prime and perform what other function?

- ☐ (A) To return oil to the main reduction gear sump
- ☒ (B) To prevent reverse flow of oil through a secured pump
- ☐ (C) To increase system pressure
- ☐ (D) None of the above

*If choice B is selected set score to 1.*

**18.** Your first step in response to a gas turbine engine high lube oil sump temperature alarm would be which of the following?

- ☐ (A) Check the oil pressure to the sump.
- ☐ (B) Check the oil filter differential pressure.
- ☒ (C) Reduce engine speed.
- ☐ (D) De-couple the engine from the main reduction gear.

*If choice C is selected set score to 1.*

**19.** The main fuel control module used on a marine gas turbine engine as shown in the illustration, is responsible for managing which function(s)? Illustration GT-0021

- ☐ (A) deceleration schedule
- ☐ (B) variable stator vane feedback lever
- ☐ (C) acceleration schedule
- ☒ (D) all of the above

*If choice D is selected set score to 1.*

**20.** The fuel purge valve on the marine gas turbine shown in the illustration, is opened \_\_\_\_\_. Illustration GT-0017

- ☐ (A) manually by the operator
- ☐ (B) automatically with auto sequencing
- ☐ (C) prior to starting
- ☒ (D) all of the above

*If choice D is selected set score to 1.*

**21.** A gas turbine engine is experiencing a high rate of corrosion in the hot section of the engine. Which of the following fuel contamination issues could be associated with this problem?

- ☐ (A) High particle content in the fuel.
- ☐ (B) High ash content in the fuel.
- ☐ (C) Low pour point of the fuel.
- ☒ (D) High salt water content in the fuel.

*If choice D is selected set score to 1.*

**22.** On a gas turbine powered vessel equipped with a synchro-self-shifting (SSS) clutch, you are preparing for a power turbine overspeed test. What would be an important action to take prior to starting the engine?

- ☐ (A) Calculate the engagement speed of the SSS clutch.
- ☐ (B) Engage the SSS clutch using air pressure.
- ☒ (C) Manually lock-out the SSS clutch from engaging using the special wrench provided.
- ☐ (D) Remove the SSS clutch locking pawls.

*If choice C is selected set score to 1.*

**23.** The purpose of the main reduction gear in a marine gas turbine propulsion installation is which of the following?

- ☐ (A) To increase gas turbine speed to engage the clutch.
- ☐ (B) To reduce gas turbine speed to engage the clutch.
- ☐ (C) To transfer low-speed gas turbine rotation to high-speed propeller rotation.
- ☒ (D) To transfer high-speed gas turbine rotation to low-speed propeller rotation.

*If choice D is selected set score to 1.*

**24.** The lubrication principal used by the Kingsbury thrust bearing is which of the following?

- ☐ (A) Free sliding oil film.
- ☐ (B) Square-shaped oil film.
- ☒ (C) Wedge-shaped oil film.
- ☐ (D) Cylinder-shaped oil film.

*If choice C is selected set score to 1.*

**25.** In cases where both the pinion and gear teeth of the main reduction gear have been slightly indented by foreign material, what action should you take?

- ☐ (A) Closely monitor the damage to see if it spreads.
- ☒ (B) Both the pinion and gear should be relieved of all raised metal around the indentation.
- ☐ (C) Replace both the pinion and gear.
- ☐ (D) Remove the foreign material that caused the indentation and return the unit to service.

*If choice B is selected set score to 1.*

**26.** To manually rotate the GE LM2500 gas turbine engine, you should use which of the following tools?

- ☒ (A) A socket wrench with an 18-inch long 3/4-inch drive extension.
- ☐ (B) 18-inch long 3/4-inch drive socket wrench.
- ☐ (C) A socket wrench with an 18-inch long 1/2-inch drive extension.
- ☐ (D) 18-inch long 1/2-inch drive socket wrench.

*If choice A is selected set score to 1.*

**27.** Why is safety-wiring, or lock wiring of gas turbine parts required?

- ☐ (A) Maintain lubrication.
- ☒ (B) Prevent disengagement of parts.
- ☐ (C) Maintain fastener torque.
- ☐ (D) Prevent corrosion.

*If choice B is selected set score to 1.*

**28.** The effectiveness of an off-line water wash of a GE LM2500 gas turbine engine can be enhanced by doing which of the following?

- ☐ (A) Motoring the engine just short of idle speed.
- ☐ (B) Washing the power turbine while still hot.
- ☒ (C) Stroking the Variable Stator Vanes to the maximum open position.
- ☐ (D) Applying the power turbine brake.

*If choice C is selected set score to 1.*

**29.** How do you gain access to the burner units of a can-annular combustor to perform maintenance?

- (A) By sliding the can-annular case aside
- (B) By removing the power turbine
- (C) By removing the annular case
- (D) By disassembling the engine

*If choice A is selected set score to 1.*

**30.** What are the two prime sources of deposits that build up on compressor blades?

- (A) Lube oil mist and fuel oil spray
- (B) Lube oil mist and salt spray
- (C) Carbon residue and lube oil mist
- (D) Salt spray and carbon residue

*If choice B is selected set score to 1.*

**31.** To prevent overheating of the illustrated turbine blade, which of the following fluids is circulated through it via the shaped internal passages? Illustration GT-0029

- (A) Cooling water.
- (B) Bleed air.
- (C) Cooling oil.
- (D) External compressed air.

*If choice B is selected set score to 1.*

**32.** When conducting a borescope inspection, you must be aware of all of the following factors EXCEPT which?

- (A) The internal reference points.
- (B) The engineer's experience.
- (C) The limitations of your equipment.
- (D) The inspection areas and ports.

*If choice B is selected set score to 1.*

**33.** Zero reference for the GE LM2500 gas turbine engine is established by the use of which of the following engine components?

- (A) Vane blades.
- (B) Vane shrouds.
- (C) Locking lug blades.
- (D) Carboloy blade pads.

*If choice C is selected set score to 1.*



**34.** Active corrosion on copper alloys is indicated by which of the following?

- ☐ (A) A verdigris formation.
- ☐ (B) A white-gray powder formation.
- ☐ (C) A copper-oxide crust formation.
- ☒ (D) A gray-green patina formation.

*If choice D is selected set score to 1.*

**35.** Cadmium and zinc coatings provide which of the following type of protection for the base metal?

- ☒ (A) Sacrificial.
- ☐ (B) Thermal.
- ☐ (C) Chemical.
- ☐ (D) Sealant.

*If choice A is selected set score to 1.*

**36.** Which of the following conditions will NOT be the result of a build-up of deposits in a gas turbine compressor?

- ☐ (A) Turbine blade corrosion.
- ☒ (B) Reduced fuel consumption.
- ☐ (C) Increased combustion gas temperatures.
- ☐ (D) Restricted air flow.

*If choice B is selected set score to 1.*

**37.** Compressor rotor blade tip curl is usually caused by which of the following?

- ☐ (A) Misalignment.
- ☐ (B) Vane rub.
- ☒ (C) Blade rub.
- ☐ (D) Object damage.

*If choice C is selected set score to 1.*

**38.** What type of metallurgical failure does Item B represent in the illustration? Illustration GT-0014

- ☐ (A) Weld cracking.
- ☒ (B) Axial cracking.
- ☐ (C) Circumferential cracking.
- ☐ (D) Radial cracking.

*If choice B is selected set score to 1.*

**39.** Compressor tip clang can be usually attributed to which of the following operating conditions?

- (A) Compressor stall.
- (B) Continuous low-power operation.
- (C) Continuous high-power operation.
- (D) Overloading.

*If choice A is selected set score to 1.*

**40.** Once a compressor is broken in, which of the following factors will most likely cause blade tips to rub?

- (A) Profiles on the blade tips
- (B) Elongation of the blade tips
- (C) Failure of a rotor bearing
- (D) Sprayed material in the stator case

*If choice C is selected set score to 1.*

**41.** The dimples of a combustor dome band that has a low operating time will usually have what kind of damage?

- (A) Burn through.
- (B) Bowing.
- (C) Cracks.
- (D) Burn away.

*If choice C is selected set score to 1.*

**42.** While underway on a ship with gas turbine engines, the most likely indication of an engine stall is which of the following?

- (A) A loud bang is heard.
- (B) Combustor temperature increases.
- (C) Engine fails to accelerate.
- (D) All of the above.

*If choice D is selected set score to 1.*

**43.** When preparing to light off a cold boiler equipped with a return flow fuel oil system, the recirculating valve directs the flow of oil \_\_\_\_\_.

- (A) directly to the fuel oil heater inlet for further warm-up
- (B) back to the suction side of the service pump
- (C) back to the fuel oil settler for further filtration
- (D) directly to the deep tanks

*If choice B is selected set score to 1.*

**44.** The maximum pressure developed by a waste heat boiler is determined by the main engine exhaust \_\_\_\_\_.

- ☐ (A) gas composition
- ☒ (B) gas temperature
- ☐ (C) pressure
- ☐ (D) timing

*If choice B is selected set score to 1.*

**45.** A photoelectric cell installed in an automatically fired auxiliary boiler burner management system \_\_\_\_\_.

- ☒ (A) opens the burner circuit upon sensing a flame failure
- ☐ (B) detects a flame failure by monitoring radiant heat from glowing refractory
- ☐ (C) requires mechanical linkage to secure the burner fuel supply
- ☐ (D) must be bypassed at low firing rates

*If choice A is selected set score to 1.*

**46.** On a ship with a marine gas turbine as shown in the illustration, a fire emergency stop is initiated when \_\_\_\_\_. Illustration GT-0016

- ☐ (A) one of the UV flame detectors is activated
- ☐ (B) the GTM fire emergency shutdown switch located on the module is activated
- ☐ (C) either the primary or reserve GTM CO<sub>2</sub> system activates
- ☒ (D) all of the above

*If choice D is selected set score to 1.*

**47.** During an operation of a main propulsion gas turbine, the engine shuts down. Which of the following is the most probable reason for the shutdown?

- ☐ (A) High lube oil temperature.
- ☐ (B) Low sump oil level.
- ☐ (C) Low fuel supply temperature.
- ☒ (D) High vibration on the gas generator.

*If choice D is selected set score to 1.*

**48.** In comparing a centrifugal-type to an axial-type compressor, which of the following statements is true?

- ☐ (A) Centrifugal compressors are more expensive to manufacture than an axial compressor.
- ☒ (B) Centrifugal compressors have a higher compression ratio per stage than an axial flow compressor.
- ☐ (C) A centrifugal compressor has a lower resistance to FOD than an axial compressor.
- ☐ (D) Centrifugal compressors have a lower compression ratio per stage than an axial compressor.

*If choice B is selected set score to 1.*

**49.** The divergent area of the exhaust duct aids in what process?

- ☐ (A) Decreasing the volume of the exhaust gases.
- ☐ (B) Increasing the pressure of the exhaust gases.
- ☒ (C) Increasing the volume of the exhaust gases.
- ☐ (D) Increasing the velocity of the exhaust gases.

*If choice C is selected set score to 1.*

**50.** The purpose of the metal spray rub coating on the rotor and stator casing of an axial-type compressor is which of the following?

- ☐ (A) control air flow through the compressor
- ☐ (B) seal the circumferential dovetails
- ☐ (C) ensure protection for the gearbox adapter when removing or replacing the bearings
- ☒ (D) provide close vane to rotor and blade to stator case clearances

*If choice D is selected set score to 1.*

**51.** Each stage of an axial compressor of a gas turbine can compress the atmospheric air a total of how many times?

- ☒ (A) 1.2 times
- ☐ (B) 2.2 times
- ☐ (C) 3.2 times
- ☐ (D) 4.2 times

*If choice A is selected set score to 1.*

**52.** Variable stator vanes give an axial gas turbine compressor which of the following capabilities?

- ☐ (A) Increased primary air flow.
- ☒ (B) Efficiency at various speeds.
- ☐ (C) Ability to operate at constant speeds.
- ☐ (D) Increases pressure ratios.

*If choice B is selected set score to 1.*

**53.** Two functions of the compressor stator vanes include which of the following?

- ☐ (A) Direct air flow to rotor blades at the correct angle and are shaped to maintain a constant velocity and produce a pressure increase.
- ☐ (B) Direct air flow to rotor blades at the correct angle and are shaped to produce a velocity increase and maintain a constant pressure.
- ☒ (C) Direct air flow to each rotor stage at the correct angle and deliver air to the combustor at the correct velocity and pressure.
- ☐ (D) Direct air flow to rotor blades at the correct angle and are shaped to cause a velocity increase and a pressure decrease.

*If choice C is selected set score to 1.*

**54.** Why are loose-fitting blades used on the first several stages of large axial compressors?

- (A) To minimize vibration while the engine is passing through critical speed ranges.
- (B) To compensate for a malfunctioning compressor support bearing.
- (C) To compensate for the abrasive action of the blade tips.
- (D) To maintain close tolerances in the compressor.

*If choice A is selected set score to 1.*

**55.** Which of the following statements is true concerning axial compressor disk-type rotors?

- (A) Rotor discs are held together by through bolts.
- (B) Rotor is only suitable for low-speed compressors.
- (C) Rotor discs are shrunk fit onto a steel shaft.
- (D) Rotor consists of rings that are flanged to fit one against the other.

*If choice C is selected set score to 1.*

**56.** The three most common types of combustors used in gas turbine engines are which of the following?

- (A) can, vortex, and can-vortex.
- (B) can, angular, and can-angular.
- (C) can, annular, and can-annular.
- (D) can, derivative, and can-derivative.

*If choice C is selected set score to 1.*

**57.** A centrifugal flow gas turbine uses what type of combustion chamber?

- (A) annular
- (B) can
- (C) double-annular
- (D) can-annular

*If choice B is selected set score to 1.*

**58.** The secondary passages on the gas turbine engine fuel nozzles shown in the illustration are designed to open at approximately what pressure? Illustration GT-0005

- (A) 30 psig
- (B) 130 psig
- (C) 230 psig
- (D) 330 psig

*If choice D is selected set score to 1.*

**59.** Electric igniters used on modern marine gas turbine engines, commonly operate on a secondary voltage of \_\_\_\_\_. Illustration GT-0017

- ☐ (A) 115 to 440 volts AC
- ☐ (B) 450 to 1000 volts AC
- ☒ (C) 10,000 to 20,000 volts AC
- ☐ (D) 50,000 to 100,000 volts AC

*If choice C is selected set score to 1.*

**60.** The turbine nozzles convert heat and pressure energy to velocity energy by means of which of the following?

- ☐ (A) Convergent-Divergent process.
- ☐ (B) Divergent process.
- ☒ (C) Convergent process.
- ☐ (D) Deflection process.

*If choice C is selected set score to 1.*

**61.** How do the high-velocity high-temperature gases cause the gas turbine rotor to rotate?

- ☒ (A) By transferring velocity energy and thermal energy to the turbine blades.
- ☐ (B) By increasing the velocity of the gases.
- ☐ (C) By converting the high-velocity gas to low-velocity gas.
- ☐ (D) By creating a low-pressure area before the rotor.

*If choice A is selected set score to 1.*

**62.** The circle of turbine stationary vanes that convert pressure and thermal energy to velocity energy and direct the combustion gases in the direction of turbine wheel rotation is referred to as what?

- ☐ (A) Compressor assembly.
- ☐ (B) Diffuser assembly.
- ☒ (C) Nozzle assembly.
- ☐ (D) Rotor assembly.

*If choice C is selected set score to 1.*

**63.** The turbine nozzle blades convert the combustion gases heat and pressure energy into what form of energy?

- ☐ (A) Chemical
- ☐ (B) Electrical
- ☒ (C) Kinetic
- ☐ (D) Thermal

*If choice C is selected set score to 1.*

**64.** Turbine disks are commonly attached to the shaft by which of the following methods?

- ☐ (A) Pinned or locking tabs.
- ☒ (B) Bolted or welded.
- ☐ (C) Riveted or pinned.
- ☐ (D) Locking tabs or retaining rings.

*If choice B is selected set score to 1.*

**65.** HP turbine blades are generally cooled by which of the following methods?

- ☐ (A) Compressed air entering the tip and exiting the root.
- ☐ (B) Cooling water entering the tip and exiting the root.
- ☐ (C) Cooling water entering the root and exiting the tip.
- ☒ (D) Compressed air entering the root and exiting the tip.

*If choice D is selected set score to 1.*

**66.** Which of the following is an advantage of a single-shaft gas turbine engine compared to a split-shaft gas turbine engine?

- ☐ (A) Better fuel economy
- ☐ (B) Reversible
- ☐ (C) Lower starting torque
- ☒ (D) Fewer moving parts

*If choice D is selected set score to 1.*

**67.** What type of air seal is used in the combustor and turbine midframe of a gas turbine?

- ☐ (A) Pneumatic carbon ring
- ☐ (B) Lip-type
- ☒ (C) Fishmouth
- ☐ (D) Labyrinth-Honeycomb

*If choice C is selected set score to 1.*

**68.** What type of seal is used in the gearbox of a gas turbine engine?

- ☒ (A) Carbon ring
- ☐ (B) Lip-type
- ☐ (C) Labyrinth-Windback
- ☐ (D) Fishmouth

*If choice A is selected set score to 1.*

**69.** Which of the following statements is true regarding centrifugal compressors?

- (A) The efficiency of a centrifugal compressor is greater than that of an axial compressor.
- (B) The impeller of a centrifugal compressor has a radial inlet and axial discharge.
- (C) The centrifugal compressor is frequently used on small, low power turbines.
- (D) Centrifugal compressors are complicated in design and heavy.

*If choice C is selected set score to 1.*

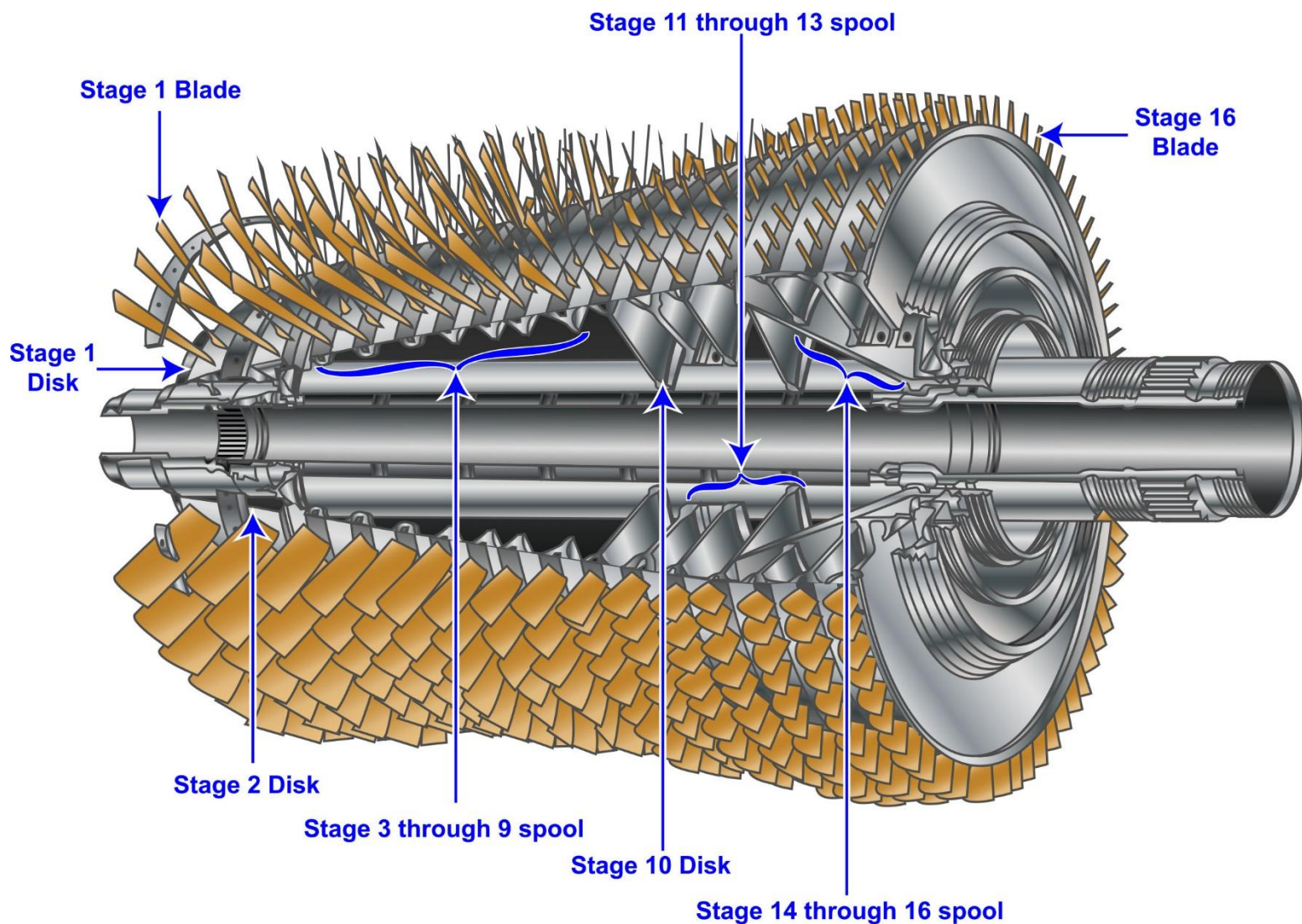
**70.** Before combustion can occur, the combustion air must be delivered to the combustor at a high-pressure and low-velocity. High-velocity, low-pressure air is converted to high-pressure, low-velocity air at what part of a centrifugal-type compressor?

- (A) Impeller.
- (B) Turning vanes.
- (C) Inlet plenum.
- (D) Diffuser.

*If choice D is selected set score to 1.*



## GT-0004



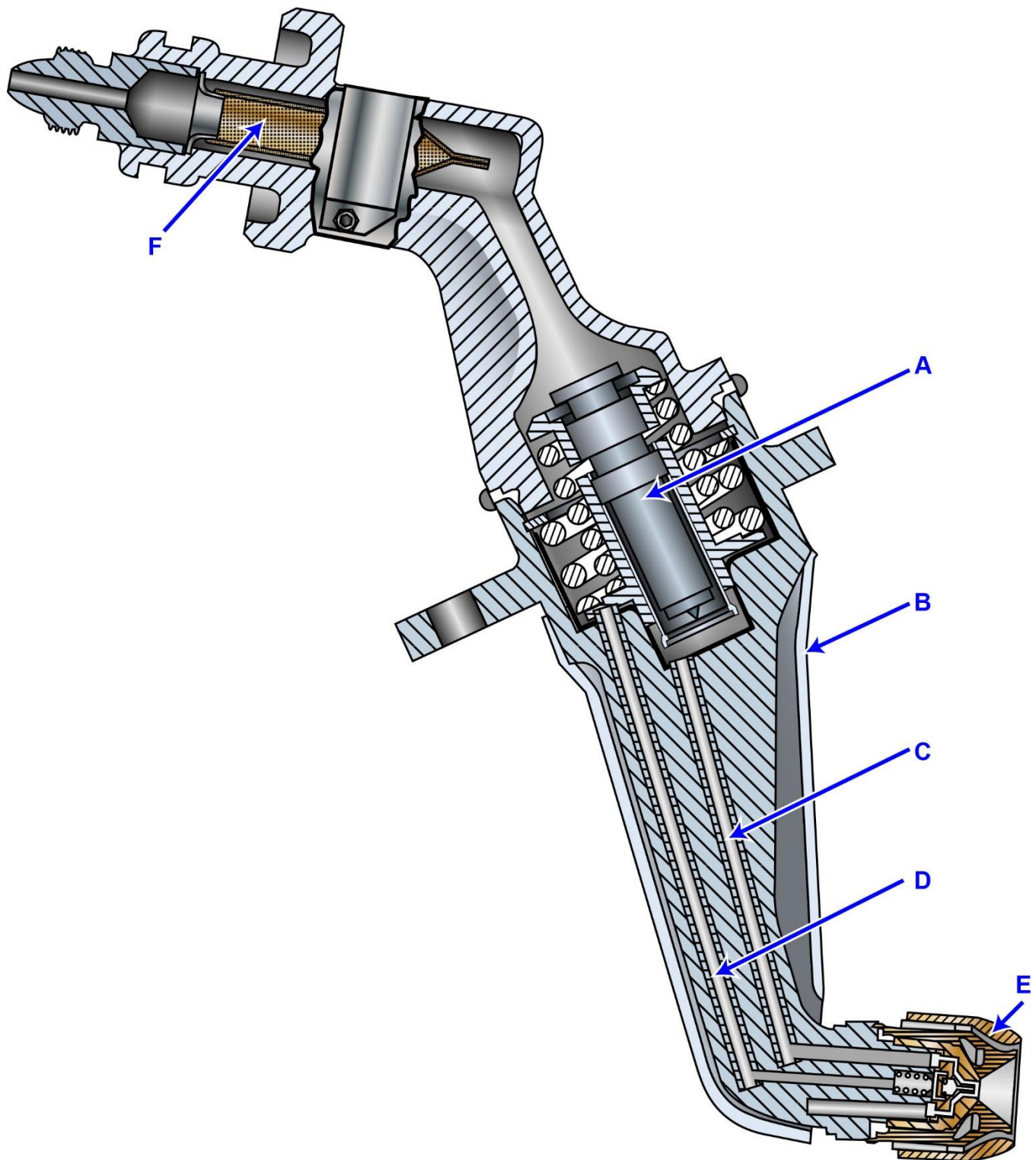
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## GT-0005



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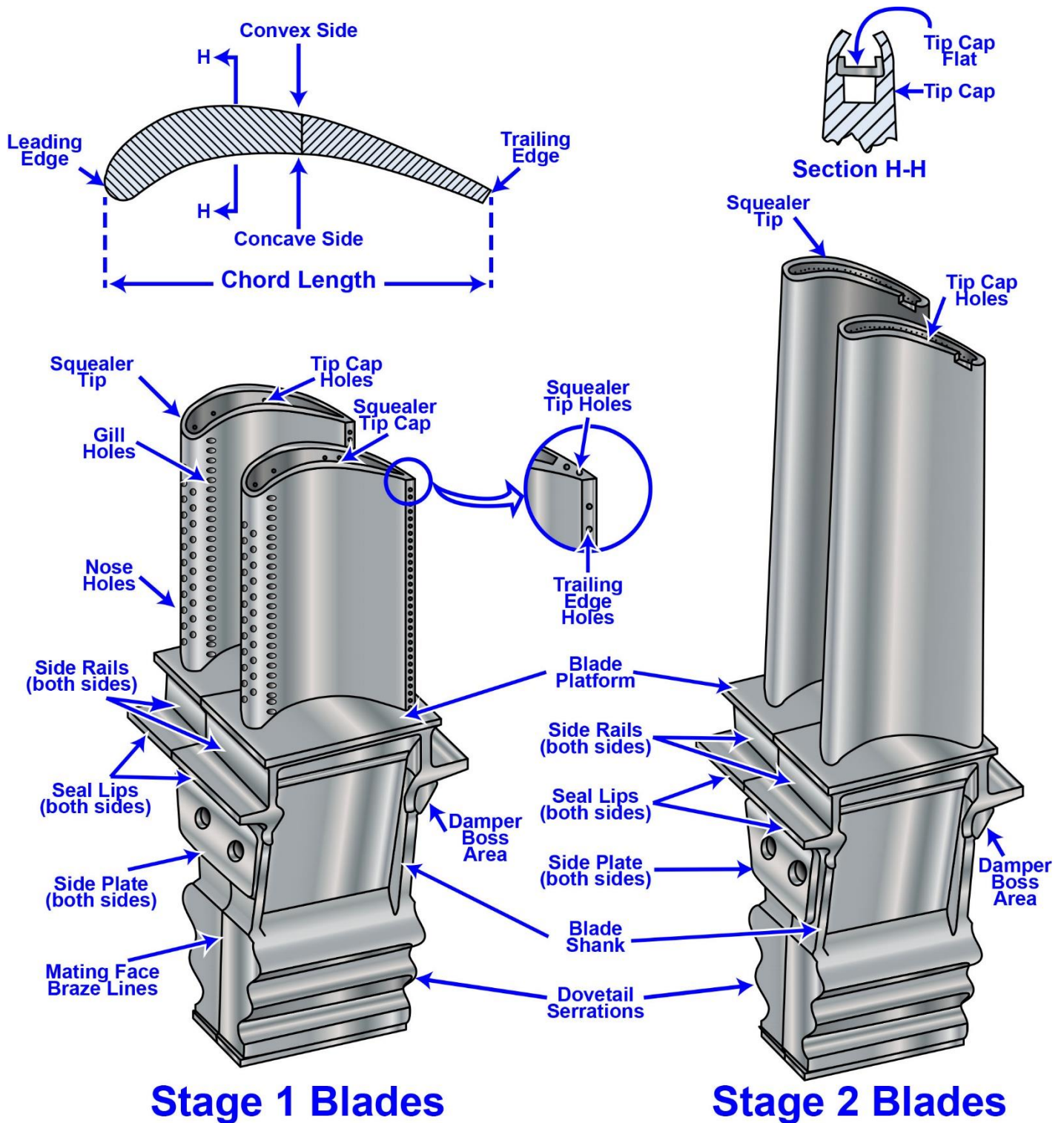
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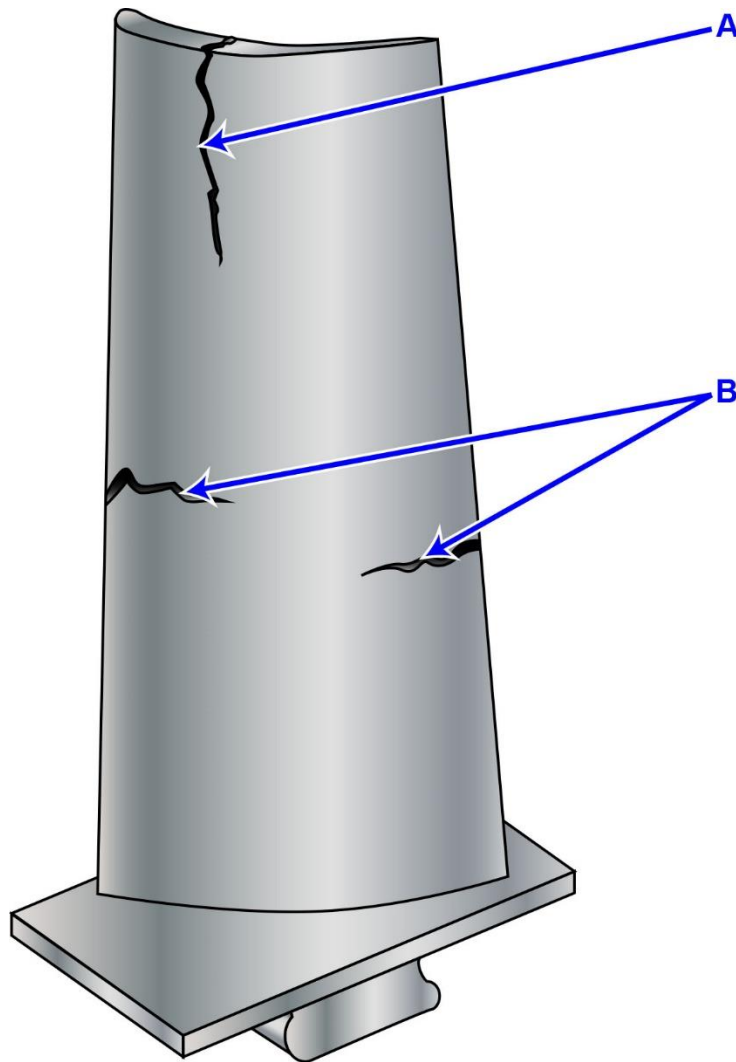


## GT-0011



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## GT-0014



## GT-0016

**FUEL OIL**

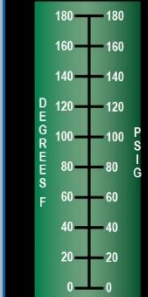
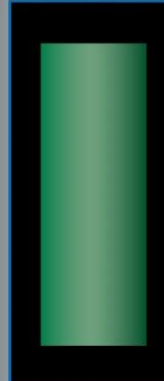
PUMP B FAULT	PUMP A FAULT	HEADER TEMP HI/LO
TANK B TEMP HI/LO	TANK A TEMP HI/LO	HEADER PRESS HI
		HEATER TEMP HI
SUCTION STR Δ P HI	DRAIN TANK LEVEL HI	FILTER WATER HI
		FILTER Δ P HI

TK B SUCT VALVE OPEN	TK A SUCT VALVE OPEN	
TK B RECIRC VALVE OPEN	TK A RECIRC VALVE OPEN	
TK B SUCT VALVE CL	TK A SUCT VALVE CL	FILTER A BLOCKED
TK B RECIRC VALVE CL	TK A RECIRC VALVE CL	FILTER B BLOCKED


  


**HEADER**  

TEMP	PRESS
	


  


**SERVICE TANK VALVES**  

B  
OPEN  
  
CLOSE

A  
OPEN  
  
CLOSE

B  
EMERG TRIP  



A  
EMERG TRIP  


**PUMP**  

B  
FAST  
  
SLOW  
  
STOP

A  
FAST  
  
SLOW  
  
STOP

**PUMP MODE**  
 MANUAL  


B LEAD
A LEAD

**CONTROL TRANSFER**  

REMOTE

LOCAL

**GTM B**

FUEL TEMP LO	LUBO LEVEL HI	LUBO COOLER OUT TEMP HI	COOLING AIR OUT TEMP HI	
FUEL FILTER BLOCKED	LUBO SCAV FILTER BLK	LUBO SUPPLY FILTER BLK	CLUTCH FAIL TO DISENGAGE	CLUTCH FAIL TO ENGAGE
				FIRE DETECTOR FAIL


  


	NO. 1 FUEL VALVE OPEN	TACH NO. 1 LOSS	STARTER CUTOUT	BLEED AIR VALVE OPEN
	NO. 2 FUEL VALVE OPEN	TACH NO. 2 LOSS	WATER WASH HEATER ON	

**WATER WASH**  


TANK EMPTY

WASH  
ON  
  
OFF


HEATER  
ON  
  
OFF

OUT OF  
SERVICE


NORMAL



**START COUNTER**  



**GTM TIMER**  

HOURS  


**MANUAL START**

VENT DAMPER OPEN VENT DAMPER CLOSE	COOLING FAN ON COOLING FAN OFF	BLEED VALVE OPEN BLEED VALVE CLOSE	STARTER AIR ON	IGNITER ON	MAIN FUEL VALVE OPEN MAIL FUEL VALVE CLOSE
FUEL LOW TEMP OVDR	FUEL PURGE ON	CLUTCH ENGAGE	CLUTCH DISENGAGE	BRAKE ON	BRAKE OFF


  


COMPUTER  
TEST ON  
PASS

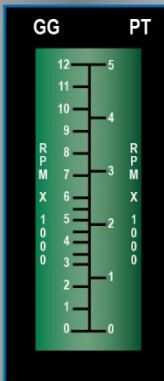
PT OVSP  
TRIP  
RESET

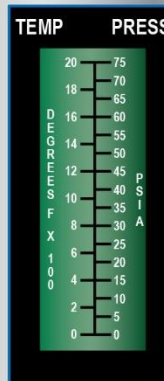
VIB  
ANALYZER  
TEST ON

**MAIN FUEL VALVE CHECK SWITCH**  

NO. 1  


NO. 2  


SPEED  
 GG PT  


PT INLET  
 TEMP PRESS  



**EMERGENCY CONTROLS**

FIRE SYS  
DISABLED  
PUSH TO  
RESTORE

CO2 RELEASE  
INHIBIT

BATTLE  
OVRD ON

EMERGENCY  
STOP



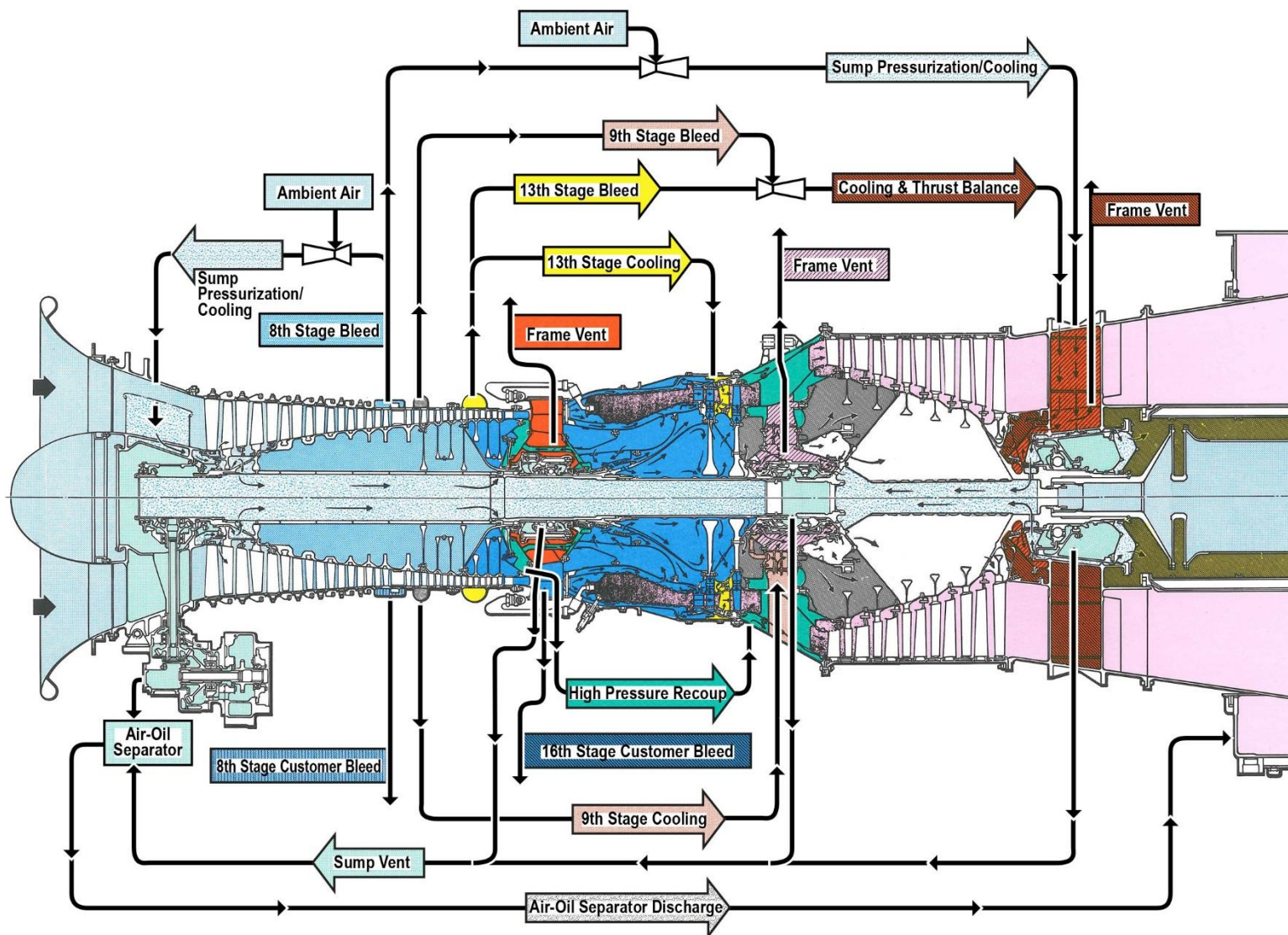
Adapted for testing purposes only from Gas Turbine Systems Technician (Electrical)

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## GT-0017

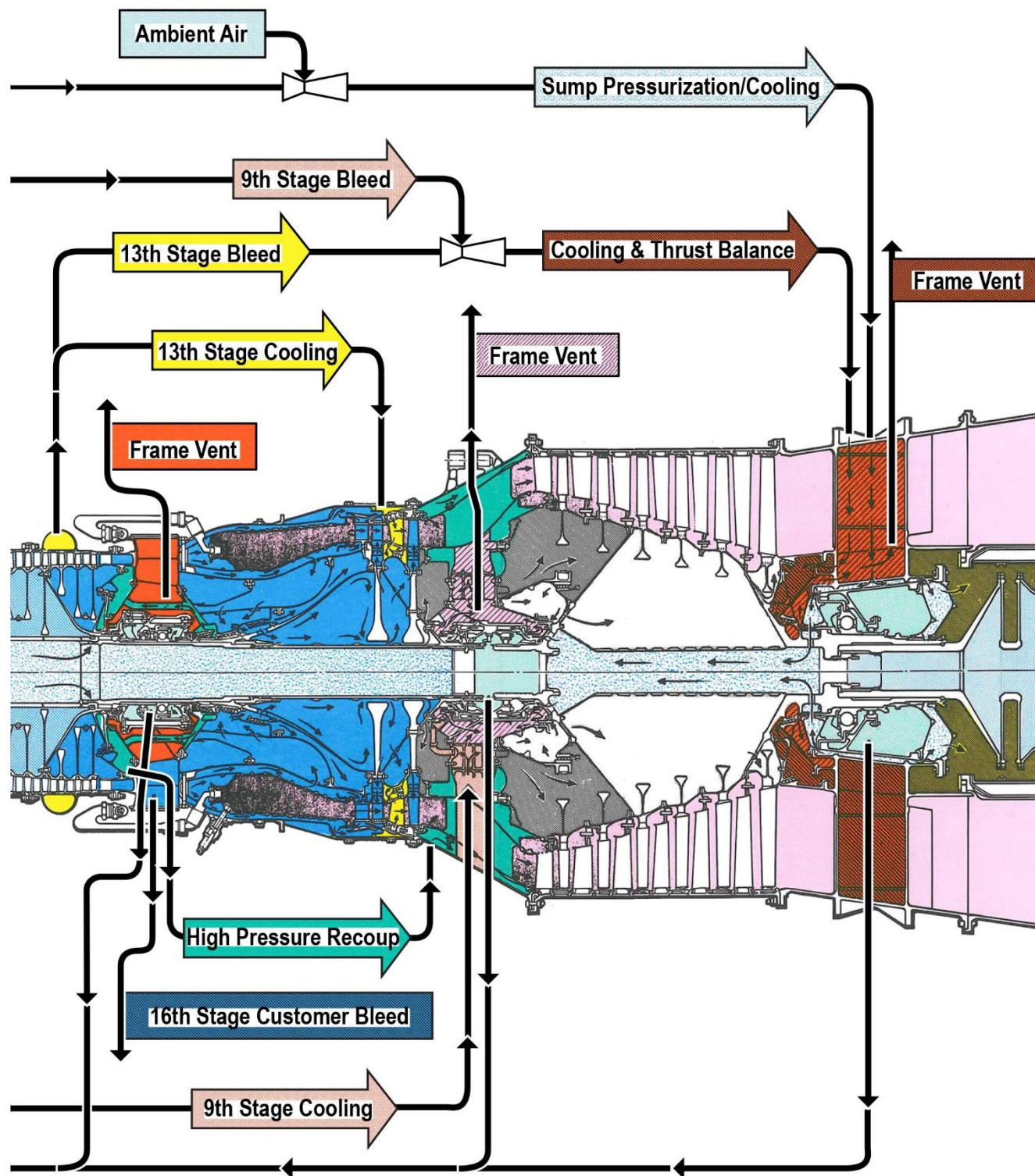


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## GT-0020



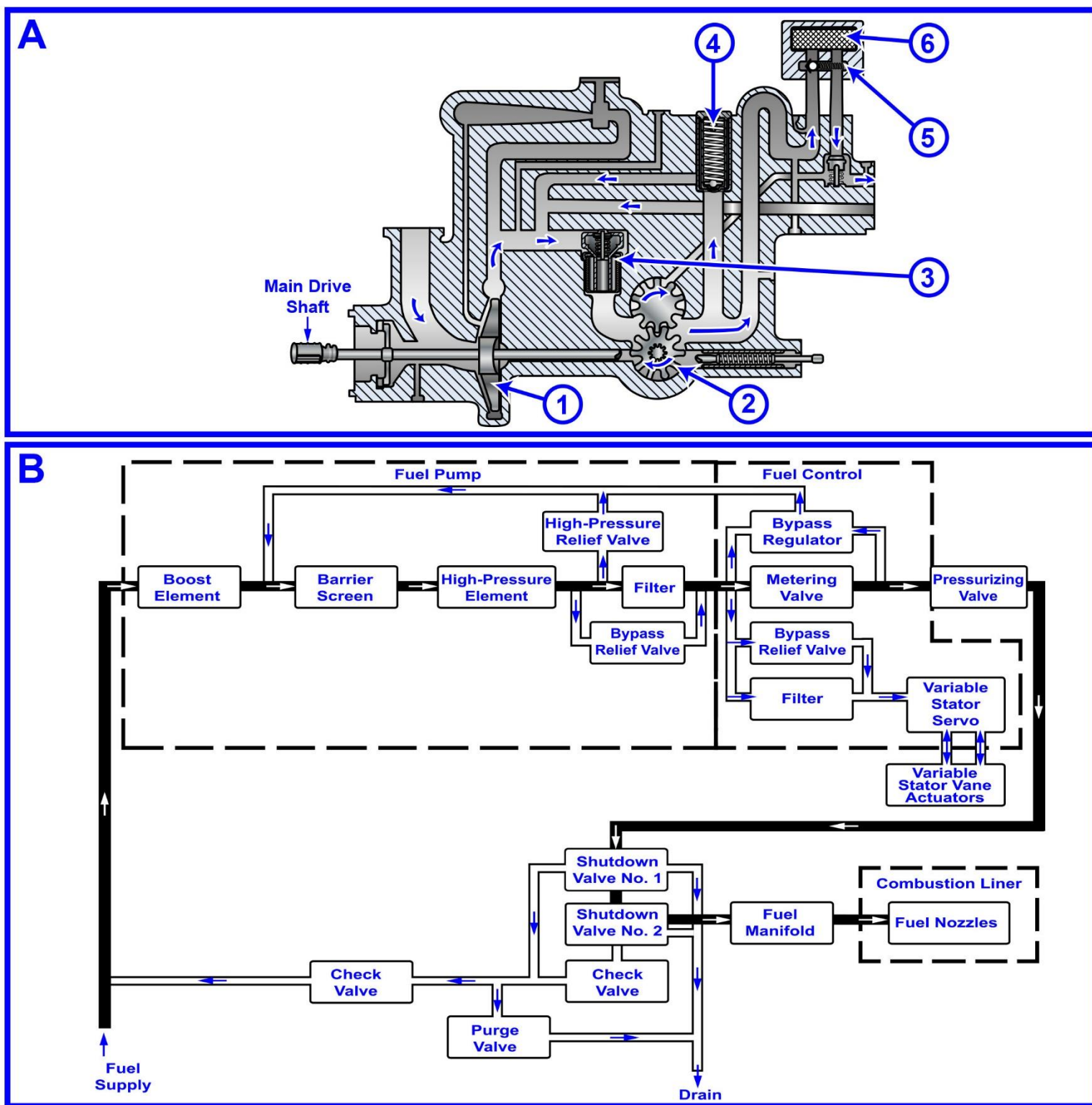
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## GT-0021



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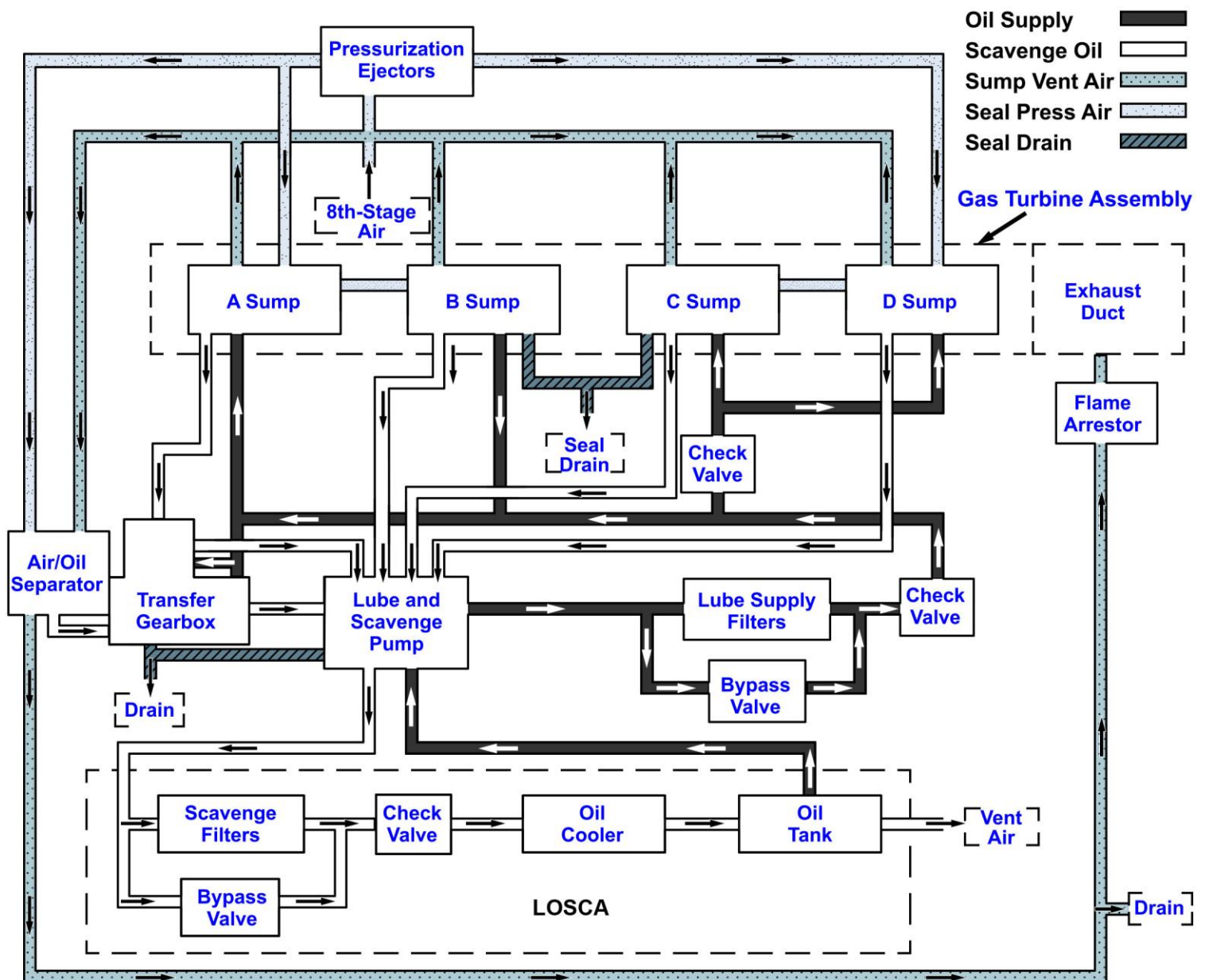
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# GT-0024



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## GT-0029

