A Control Conference of Control Contro	Parameter	Directions	Potential Causes	Recommended Action	Suggested Checklist	Further Root Cause Checklist
And the control where the control of						Check for cooling water pump performance and
Segment of the control of the contro		-	-		-	
	Temperature	High	2. Scaling or fouling of the heat exchanger		2. Inspect for leaks in the heat exchanger	Check for proper heat exchanger maintenance
March Marc	Temperature	High	3. Faulty thermostat	3. Replace the thermostat	3. Confirm proper thermostat operation	·
	Temperature	Low	Overcooling due to excessive flow	Adjust or control the cooling water flow rate	Monitor cooling water flow rate	
March Marc	Temperature	Low	2. Air pockets in the cooling system	2. Bleed air from the cooling system		2. Check for cooling system leaks and integrity
Security of the Control of Security of Sec		Low	3. Malfunctioning temperature sensor	3. Calibrate or replace the temperature sensor		3. Check and calibrate temperature sensors
Content Co	Air Cooler Cooling Water Outlet	High	1. Reduced cooling water flow rate	1. Inspect and clean cooling water strainers	Monitor cooling water flow rate	Check for cooling water pump performance and impeller condition
	Air Cooler Cooling Water Outlet	High	2. Scaling or fouling of the heat exchanger		2. Inspect for leaks in the heat exchanger	Check for proper heat exchanger maintenance
A COME CASE AND COUNTY OF THE PAPER OF THE CASE AND CASE	Air Cooler Cooling Water Outlet	High	3. Faulty thermostat		3. Confirm proper thermostat operation	3. Inspect and test the thermostat
ACCOUNT COME PROTECTION STATE COME PROTECTIO	Air Cooler Cooling Water Outlet	Low	Overcooling due to excessive flow	Adjust or control the cooling water flow rate	Monitor cooling water flow rate	Inspect and calibrate cooling water flow control
Contraction Name Color Security Mark Col	Air Cooler Cooling Water Outlet	Low			Verify absence of air pockets in the system	
As Coults in Service As Country and Programmer As Country and Programm		Low				
A Coult ride froat Temperature A Coult ride froat Temperature		-	- '			Inspect cooling water pump impeller and
An Coulor interface frequentum (a) 10 De 2 Autonomina volument (a	*		-			
Conforming the for informations of the Conformation of the Conform	-					
Accounts must fragmentate Accounts must fragmen	Air Cooler Inlet Fuel Temperature	High	3. Fouling of the air cooler	, -	3. Check for leaks in the air cooler	= :
AC Coder Total Traingenance AC Coder Outstand Temperature AC AC Coder Outstand Temperature AC Coder Outstand Temperature AC AC Coder Outstand Temperature AC Coder Outstand Temperatu	*	Low		necessary		Check for air cooler bypass valve functionality
A Cooker Culter full Presponsive A Cook	Air Cooler Inlet Fuel Temperature	Low	2. Insufficient fuel flow	2. Check and clean fuel lines and filters	· ·	2. Conduct a flow test on the fuel system
A Code Or Code To Later Desperation A Code Or C	Air Cooler Inlet Fuel Temperature	Low	3. Malfunctioning temperature sensor	3. Calibrate or replace the temperature sensor		·
Accounce Counter fair Temperature An Control Co	Air Cooler Outlet Fuel Temperature	High	1. Insufficient cooling water flow	Check and clean cooling water passages	Verify cooling water pump functionality	
A Coder Out-first interpretative with A Coder Out-first image state image and the Coder Out-first image and the Coder Out-firs	Air Cooler Outlet Fuel Temperature	High	2. Cooling water pump malfunction		2. Monitor cooling water pump pressure	2. Conduct flow test on cooling water pump
A Coder Cutoff Fast Temperature Low 2 Institution for the Coder Types of permission 1 Coder for air coder types of permission 2 Coder fast allow for the fast of coder types of the fast of types	Air Cooler Outlet Fuel Temperature	High	3. Fouling of the air cooler	3. Clean the air cooler surfaces and passages	3. Check for leaks in the air cooler	Perform a thorough inspection of the air cooler surfaces
All Coaler Cubel Fast Temperatures one 2. Institutes or register the superature sensor all Coaler Cubel Fast Temperatures one 2. Administration present entirely all Coaler Cubel Fast Temperatures one 2. Administration present entirely all Coaler Cubel Fast Temperatures one 2. Administration present entirely all Coaler Cubel Fast Temperatures one 2. Compression Pressure one 3. Administration present entirely all Coaler Cubel Fast Temperatures one 2. Coaler Son Sensor one 3. Administration present entirely all Coaler Cubel Fast Temperatures one 3. Administration present entirely all Coaler Cubel Fast Temperatures one 3. A Fast Quality Institute Compression Pressure one 3. A Fast Quality Institute one 4. And Quality Institute one 5. And Coaler Cubel Fast Temperatures one 5. And Coaler Cubel Fast Temperatures one 6. And Coaler Fast Temperature one 6. And Coaler Cubel Fast T	Air Cooler Outlet Fuel Temperature	Low	Air cooler bypass open		Verify air cooler bypass position	Check for air cooler bypass valve functionality
Compression Pressure Ingit 1. Cylinder design States Ingit 2. Curbon Disposits Compression Pressure Ingit 3. Share Timing States Ingit 2. Curbon Disposits Ingit 3. Share Timing States Ingit 3. Share Timing States Ingit 4. Fact Clarify share Ingit 4. Fact Clarify share Ingit 5. Share Timing States Ingit 5. Share Timing State	Air Cooler Outlet Fuel Temperature	Low	2. Insufficient fuel flow		2. Monitor fuel pressure	Conduct a flow test on the fuel system
Compression Pressure Inigh I Cylinder Saving Issues I Propect and replace worm piston rings or valves Compression Pressure I High I Collinder Saving Issues I Collinder Saving Issues I High I Loadaga in Cylinder or Yolles I Loadaga in Cyli	Air Cooler Outlet Fuel Temperature	Low	Malfunctioning temperature sensor	Calibrate or replace the temperature sensor		Check and calibrate temperature sensors
Compression Pressure Night 2. Carbon Deposits 2. Perform decarbonization procedures 3. Application of the composition Pressure 1. Section 1. Section	•	High			Conduct a compression test, identify and	Inspect and measure cylinder components for
Compression Pressure Nigh A Fall Callarly toxes A Use Principal Stude A Compression Pressure A Use Principal Stude A Compression Pressure A Use Principal Stude A Compression Pressure A Use A Compression Pressure A District Compression District Compres	-		-			wear and tear 3. Inspect and clean injectors for proper fuel
Compression Pressure Low 1. Leadage in Optimizer or Valves 2. Leadage in Optimizer	•	-				atomization and distribution 4. Validate timing with specialized equipment and
Compression Pressure Low 2. Inadequate Lubrication 1. Lackage in Conformation of pattern of pattern of pattern of the State Compression Pressure Low 2. Inadequate Lubrication 3. Adjust with education of pattern rings and objustice Compression Pressure Low 3. Incorrect Valve Clearance 3. Adjust with education of pattern rings and objustice Compression Pressure Low 4. Industry Restriction Compression Pressure Low 4. Industry Restriction 1. Carbon degrate update pattern components for any and objustice Low and the Compression Pressure 1. Carbon degrate on option rings and opinities 1. Carbon degrate on option rings and opinities 2. Industry Restriction Compression Pressure 1. Industry Restriction 1. Carbon degrate on opinities in the second or pattern rings and opinities 2. Industry Restriction 2. Industry Restriction 1. Carbon degrate on opinities in the second or pattern rings and opinities 2. Industry Restriction Compression Pressure 1. Industry Restriction 1. Leaking pattern or opinities and adjust where for proper resting and operation Compression Pressure 1. Leaking pattern or opinities and adjust where for proper restring and operation Compression Pressure 1. Leaking pattern or opinities and adjust where for proper restring and operation Compression Pressure 1. Leaking pattern or opinities and adjust where for proper restring and operation Compression Pressure 1. Leaking pattern or opinities and adjust where for proper restring and operation Compression Pressure 1. Leaking pattern or opinities and adjust where clearance as per 2. Industry and adjust with the compression of adjust with the compression pressure 1. Leaking pattern or opinities and adjust with the compression pressure and adjust with the compression pressure and adjust with the compression pressure and adjust with the leaking pattern or opinities and adjust with the compression pressure and adjust with the compression pressure and adjust with the leaking pattern or opinities and adjust with the compre	•	-	-			assess timing components 5. Investigate fuel system for irregularities, such as
Compression Pressure Low A Interview Libration Applies where the control of piston rings and compression Pressure Low A Interview Claimance A Injury where designance to specifications A Injury where		-	-	carbon buildup	filters, assess fuel delivery system	pressure or flow issues
Compression Pressure Compression Pressure Compression Pressure Low A Exhaust Restriction A Light with elearance to specifications A light with elearance to specification in control maintenance Low a light with elearance to specifications A light with with elearance to specifications A light with with elearance to specification in routine maintenance Low a light with elearance to specifications A light with with elearance to specification in routine maintenance Low a light elearance to specifications A light with with elearance to specifications A light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specifications A light with elearance to specifications A light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specifications A light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specifications A light with elearance to specification in routine maintenance Low a light with elearance to specification		Low		valves	leaks	signs of leakage
Compression Pressure Compression Pressure High 1. Carbon deposits on piston rings and cylinder with a contract of the carbon pressure with the program of the contract of t	Compression Pressure	Low	2. Inadequate Lubrication			malfunctions and wear
compression Pressure Note 1. Carbon deposits on piston rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization in routine maintenance 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization in routine maintenance 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization in routine maintenance 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder walls 1. Perform decarbonization and clean pisson rings and cylinder pisson rings and replacement 1. Perform decarbonization and clean pisson rings 1. Perform decarboni	Compression Pressure	Low				damage
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Operation Pressure High 3. Worn or damaged piston rings 3. Impect and replace worn or damaged piston rings 3. Induced pation ring impection and replacement 3. Investigate factors causing certificate with piston rings 3. Induced pation ring impection and replacement 3. Investigate factors causing cylinder or piston rings 4. Perform leak-down test to identify and fix leaks 5. Include leaked cown test in routine maintenance 5. Investigate factors causing cylinder or piston rings 5. Compression Pressure 5. Vov. 2. Inadequate compression due to valve clearance speed 5. Compression Pressure 5. Compression Pres	Compression Pressure	High			1. Include decarbonization in routine maintenance	Investigate factors leading to carbon deposits
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Exhaust Gas Temperature Low 1. Rich Air-Fuel Mixture 2. Repair or replace malfunctioning ignition Components 2. Repair or replace malfunctioning ignition Components 3. Check and calibrate fuel injectors for proper functioning operation Components Components 3. Check and calibrate fuel injectors for proper functioning operation Components C	Exhaust Gas Temperature	High	4. Malfunctioning EGR System	4. Repair or replace faulty Exhaust Gas	4. Perform EGR system tests, inspect for proper	4. Validate EGR system with specialized
Exhaust Gas Temperature Low 2. Ignition Misfire 2. Repair or replace malfunctioning ignition Components Components 3. Check and calibrate fuel injectors for proper operation 3. Inadequate Fuel Injection 3. Inductors in the injection system operation 4. Exhaust Gas Temperature 4. Exhaust System Leak 4. Exhaust System 5. Include load monitoring and compliance checks in routine 6. Include air-fuel mixture checks in routine 7. Include injection system for irregularity 8. Adjust the air-fuel mixture to the manufacturer's recommendations 8. Include injection system for irregularity 8. Assess fuel injection system components 9. Assess fuel injection system inspect to detect leaks, inspect 1. Include load monitoring and compliance checks in routine 9. Include air-fuel mixture checks in routine 9. Include air-fuel mixture checks in routine 9. Include indition system checks in routine 9. Include indition system chec	Exhaust Gas Temperature	Low	1. Rich Air-Fuel Mixture		Inspect and adjust fuel injectors, ensure proper	Conduct emission tests, inspect oxygen sensors
Exhaust Gas Temperature Low 4. Exhaust System Leak Low 4. Exhaust System Leak Exhaust Gas Temperature Low 4. Exhaust System Leak Exhaust Gas Temperature Low 4. Exhaust System Leak Exhaust Gas Temperature Low 1. Reduced Load 1. Operate the engine within the specifical oad range and primize combustion chamber conditions Exhaust Gas Temperature Low 2. Rich Fuel Mixture 2. Adjust the air-fuel mixture to the manufacturer's Exhaust Gas Temperature Low 3. Exhaust System Leaks 3. Investigate factors causing overloading 1. Investigate factors causing overloading 2. Investigate factors causing overloading 3. Investigate factors causing overloading 1. Investigate factors causing overloading 1. Investigate factors causing overloading 2. Investigate factors causing overloading 2. Investigate factors causing overloading 2. Investigate factors causing overload	Exhaust Gas Temperature	Low	2. Ignition Misfire		2. Check spark plugs, ignition coils, and wires for	Investigate ignition system for irregularities or
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Exhaust Gas Turbocharger Inlet High 1. Reduced airflow to the turbocharger 1. Inspect and relations causing exhaust system leaks routine maintenance 2. Investigate factors causing exhaust leaks routine maintenance 3. Investigate factors causing exhaust leaks routine maintenance 4. Investigate factors causing exhaust leaks routine maintenance 5. Investigate factors causing exhaust leaks routine maintenance 7. Investiga	Exhaust Gas Temperature	Low	2. Rich Fuel Mixture		maintenance	2. Investigate factors causing rich fuel mixture
Temperature 1. Inspect and clean air metrs 1. Inspect air metrs		Low	3. Exhaust System Leaks	3. Inspect and repair exhaust system leaks		
Exhaust Gas Turbocharger Inlet High 2 Faulty or worm-out turbocharger components 2. Perform a visual inspection of the turbocharger 2. Inspect turbocharger components for wear and 2. Conduct a thorough inspection of the	Temperature	High	Reduced airflow to the turbocharger	•		
Temperature Temperature Temperature Components Co		High	2. Faulty or worn-out turbocharger components			

Exhaust Gas Turbocharger Inlet	High	3. Combustion issues, such as incomplete	Check and service fuel injectors	3. Monitor combustion parameters	3. Investigate and diagnose combustion-related
Temperature Exhaust Gas Turbocharger Inlet	High	combustion or misfiring 4. Heat exchanger fouling or scaling	Perform chemical cleaning of heat exchanger	4. Inspect for leaks in the heat exchanger	issues 4. Check and maintain heat exchanger
Temperature Exhaust Gas Turbocharger Inlet	-		surfaces 1. Monitor and maintain optimal fuel-air mixture	-	components 1. Investigate and optimize combustion
Temperature Exhaust Gas Turbocharger Inlet	Low	Improved combustion efficiency	ratios 2. Confirm proper functioning of air intake and	Monitor combustion parameters Monitor air filter condition and intake system	parameters
Temperature Exhaust Gas Turbocharger Inlet	Low	Adequate airflow to the turbocharger	filtration systems	integrity 3. Confirm instrument readings match actual	Check and maintain air intake components
Temperature	Low	Malfunctioning temperature sensor	Calibrate or replace the temperature sensor	values	Check and calibrate temperature sensors
Exhaust Gas Turbocharger Outlet Temperature	High	Overheating of the turbocharger components	1. Inspect and clean air filters	1. Monitor air filter condition	Check for air filter restrictions and intake system integrity
Exhaust Gas Turbocharger Outlet Temperature	High	2. Excessive exhaust gas temperatures	Monitor and optimize engine combustion parameters	2. Check for abnormal combustion and misfiring	Investigate and diagnose combustion-related issues
Exhaust Gas Turbocharger Outlet Temperature	High	3. Restricted or leaking exhaust system	Inspect and rectify any restrictions or leaks in the exhaust system	3. Check for exhaust system leaks and restrictions	Conduct a thorough inspection of the exhaust system
Exhaust Gas Turbocharger Outlet Temperature	Low	1. Insufficient engine load	Ensure the engine operates within the recommended load range	1. Monitor engine load conditions	Investigate and optimize engine load conditions
Exhaust Gas Turbocharger Outlet Temperature	Low	2. Reduced combustion efficiency	2. Check and service fuel injectors	2. Monitor combustion parameters	Investigate and optimize combustion parameters
Exhaust Gas Turbocharger Outlet Temperature	Low	3. Faulty or worn-out turbocharger components	Perform a visual inspection of the turbocharger components	Inspect turbocharger components for wear and damage	Conduct a thorough inspection of the turbocharger components
Exhaust Gas Turbocharger Outlet Temperature	Low	4. Heat exchanger fouling or scaling	Perform chemical cleaning of heat exchanger surfaces	4. Inspect for leaks in the heat exchanger	Check and maintain heat exchanger components
Fuel Pump Index	High	Overly rich fuel mixture	Check and adjust fuel injection settings	Monitor exhaust gas emissions	Investigate and optimize fuel injection parameters
Fuel Pump Index	High	Faulty fuel pressure regulator	Inspect and replace the fuel pressure regulator	Check fuel pressure consistency	2. Diagnose and address issues with the pressure
Fuel Pump Index	High	3. Clogged fuel injectors	Perform fuel injector cleaning or replacement	Monitor fuel injector performance	regulator 3. Investigate and address issues with individual
Fuel Pump Index	Low	Lean fuel mixture	Check and adjust fuel injection settings	Monitor exhaust gas emissions	injectors 1. Investigate and optimize fuel injection
Fuel Pump Index	Low	2. Reduced fuel pressure	2. Inspect and address fuel system for leaks or	Check fuel pressure consistency	parameters 2. Diagnose and address issues with the fuel
Main Engine RPM	High	Incorrect Fuel-Air Mixture	1. Adjust the fuel injectors for optimal mixture	Monitor and adjust the air-fuel ratio	delivery system 1. Perform combustion analysis, inspect fuel
		2. Throttle Control Issues		Check throttle linkage, sensors, and control	injectors for irregularities 2. Evaluate throttle response, look for anomalies in
Main Engine RPM	High		Inspect and calibrate throttle control system	mechanisms 3. Monitor load distribution, avoid prolonged high-	control signals
Main Engine RPM		3. Overloading or High Load Conditions	3. Reduce load or redistribute engine workload	load operations 1. Inspect fuel filters, lines, and pump for	components for stress 1. Conduct fuel quality analysis, check for
Main Engine RPM	Low	1. Fuel Supply Issues	Ensure adequate and clean fuel supply	blockages or contamination 2. Inspect spark plugs, ignition coils, and wiring for	impurities or water content
Main Engine RPM		2. Ignition System Problems	Check and repair issues with the ignition system	faults	component conditions 3. Evaluate system response to throttle commands,
Main Engine RPM	Low	3. Throttle Control Malfunction	Inspect and repair the throttle control system Optimize air-fuel mixture for improved	and control mechanisms 1. Monitor and adjust air-fuel ratio during	look for inconsistencies 1. Analyze combustion characteristics, inspect
Mean Effective Pressure	High	1. Combustion Efficiency	combustion efficiency	operation	spark plugs and ignition system
Mean Effective Pressure	High	2. Ignition Timing	2. Ensure proper ignition timing settings	Check and adjust ignition timing as per specifications	Validate timing with specialized equipment and assess timing components
Mean Effective Pressure	High	3. Cylinder Compression	Check and equalize compression across cylinders	as necessary	Inspect valves, piston rings, and cylinder condition
Mean Effective Pressure	Low	1. Air Intake Issues	Inspect air filters, check for restrictions or blockages	Regularly replace air filters, clean intake components	Conduct detailed inspection of intake system for any anomalies
Mean Effective Pressure	Low	2. Exhaust Restrictions	Check for clogs or restrictions in the exhaust system	2. Inspect and clear any exhaust obstructions	Evaluate overall exhaust flow dynamics and address issues
Mean Effective Pressure	Low	3. Fuel Injection Issues	Inspect fuel injectors and address any malfunctions	Conduct fuel injector tests, ensure proper fuel delivery	Analyze injector performance and fuel delivery systems
Mean Effective Pressure	High	1. Advanced injection timing	Adjust injection timing to the manufacturer's specifications	Include injection timing verification in routine maintenance	Investigate factors leading to advanced injection timing
Mean Effective Pressure	High	2. Overfueling	Check and calibrate fuel injectors to ensure proper fuel delivery	Include fuel injector inspection and calibration in routine maintenance	2. Investigate factors causing overfueling
Mean Effective Pressure	High	3. Improper combustion	Optimize air-fuel mixture, check ignition system, and inspect combustion chamber	Include combustion system inspection and optimization in routine maintenance	3. Investigate factors affecting combustion quality
Mean Effective Pressure	Low	Late injection timing	Adjust injection timing to the manufacturer's	Include injection timing verification in routine	Investigate factors leading to delayed injection
Mean Effective Pressure	Low	Restricted air intake or exhaust	specifications 2. Inspect and clean air filters, check exhaust		Investigate factors causing air or exhaust
Mean Effective Pressure	Low	3. Fuel system issues	system for restrictions 3. Check and calibrate fuel injectors, inspect fuel		restrictions 3. Investigate factors affecting fuel system
Peak Pressure	High	1. Ignition Timing	system for leaks or blockages 1. Verify and adjust ignition timing as per	routine maintenance 1. Check ignition timing settings	performance 1. Validate timing with specialized equipment
Peak Pressure	High	2. Air-Fuel Mixture	specifications 2. Inspect and adjust air-fuel mixture for optimal	Monitor air-fuel ratio during operation	Perform detailed analysis of fuel system and
Peak Pressure	-	Cylinder Compression	combustion 3. Conduct a compression test to identify any	Check and compare compression across	combustion characteristics 3. Inspect valves, piston rings, and cylinder
	High		issues 1. Inspect fuel injectors and address any	cylinders	condition 1. Analyze injector performance and fuel delivery
Peak Pressure	Low	1. Fuel Injection Issues	malfunctions 2. Check for clogs or restrictions in intake and	Conduct fuel injector tests	systems 2. Evaluate overall airflow and exhaust flow
Peak Pressure	Low	2. Intake or Exhaust Restrictions	exhaust systems 3. Verify and adjust valve timing as per	2. Inspect air filters, check for exhaust obstructions	dynamics 3. Validate timing with specialized equipment and
Peak Pressure	Low	3. Valve Timing	specifications	Inspect valve timing settings Magnitus load distribution and adjust throattle	check for mechanical issues
Peak Pressure	High	1. Increased load on the engine	Optimize vessel speed and power demand based on operational needs	Monitor load distribution and adjust throttle accordingly Monitor and adjust injection timing during	Evaluate vessel load requirements and optimize engine operation Investigate factors influencing advanced
Peak Pressure	High	2. Advanced injection timing	2. Adjust injection timing within specified limits	Monitor and adjust injection timing during routine inspections	injection timing
Peak Pressure	High	3. Combustion chamber deposits	Regularly clean combustion chambers and check for deposits	Include combustion chamber inspection in routine maintenance	Investigate factors contributing to combustion chamber deposits
Peak Pressure	Low	1. Reduced load on the engine	Adjust vessel speed and power demand based on operational needs	Monitor load distribution and adjust throttle accordingly	Evaluate vessel load requirements and optimize engine operation
Peak Pressure	Low	2. Retarded injection timing	Adjust injection timing within specified limits	Monitor and adjust injection timing during routine inspections	Investigate factors influencing retarded injection timing
Peak Pressure	Low	3. Inadequate air-fuel mixture	Ensure proper air-fuel mixture by inspecting and cleaning fuel injectors		Investigate factors affecting air-fuel mixture quality
Scavenge Air Pressure	High	1. Air Leakage in Scavenge System	Inspect and seal any air leakage points in the system	Check gaskets, joints, and connections for leaks	Perform pressure tests, use ultrasonic equipment to detect inaudible leaks
Scavenge Air Pressure	High	2. Clogged Scavenge Air Filters	Replace or clean air filters to ensure proper airflow	2. Regularly inspect and replace air filters	Investigate filtration system for efficiency, check for contaminants
Scavenge Air Pressure	_	3. Malfunctioning Scavenge Blower	Repair or replace faulty scavenge blower components	noises	Inspect blower motor, belts, and bearings for wear or malfunctions
Scavenge Air Pressure	High	Combustion Issues Leading to High Cylinder Pressures	Address combustion problems, optimize fuel-air mixture	Check and adjust fuel injectors, inspect combustion chamber for irregularities	Perform cylinder pressure tests, assess piston rings and liners for wear
Scavenge Air Pressure	Low	Scavenge Air Leakage	Inspect and seal any air leakage points in the system	Check gaskets, joints, and connections for leaks	Perform pressure tests, use ultrasonic equipment to detect inaudible leaks
Scavenge Air Pressure	Low	2. Scavenge Blower Malfunction	Repair or replace faulty scavenge blower components	Monitor blower performance, check for unusual noises	Inspect blower motor, belts, and bearings for wear or malfunctions
Scavenge Air Pressure	Low	3. Inadequate Scavenge Air Supply	S. Ensure sufficient scavenge air supply, address restrictions	Inspect air intake system, check for clogs or blockages	Evaluate scavenge air supply components, ensure proper functioning
Scavenge Air Pressure	Low	4. Exhaust System Blockages	Inspect and clear any obstructions in the exhaust system	Check for blockages in pipes, mufflers, and catalytic converters	Investigate exhaust components for damage or wear, inspect for any leaks
Scavenge Air Temperature	High	Overheating of Turbocharger	Inspect and clean the turbocharger components	Monitor turbocharger condition, check for blockages and overheating	Conduct thermal imaging of turbocharger, assess component conditions
Scavenge Air Temperature	High	Restricted Airflow in Scavenge Air System	Inspect and clean scavenge air filters and passages	Check for blockages in air filters and ducts,	Measure and analyze scavenge air pressure and
			passages	ensure smooth airflow	temperature distribution

		1	Optimize engine room ventilation, cool the	3. Ensure proper ventilation, monitor engine room	2 Evaluate engine room cooling system (
Scavenge Air Temperature	High	3. Engine Room Temperature	Optimize engine room ventilation, cool the surroundings	temperature	Evaluate engine room cooling system, inspect for insulation issues
Scavenge Air Temperature	Low	1. Insufficient Cooling	1. Improve cooling system efficiency	Check cooling system components, inspect for leaks and malfunctions	Conduct a thorough inspection of cooling system, evaluate heat exchange
Scavenge Air Temperature	Low		2. Utilize preheating systems in cold environments	Monitor ambient temperature, consider the use of heating elements	Assess effectiveness of preheating systems, inspect for malfunctions
Scavenge Air Temperature	Low	3. Malfunctioning Temperature Sensors	sensors	inspect wiring connections	Evaluate sensor response, verify accuracy with additional temperature readings
SFOC (Specific Fuel Oil Consumption)	High	1. Increased load on the engine	Optimize vessel speed and power demand based on operational needs	Monitor load distribution and adjust throttle accordingly	Evaluate vessel load requirements and optimize engine operation
SFOC (Specific Fuel Oil Consumption)	High	2. Poor combustion efficiency		Regularly check and clean fuel injectors; perform combustion analysis	Investigate factors affecting combustion efficiency and address them
SFOC (Specific Fuel Oil Consumption)	High	3. Incorrect fuel injection timing	Adjust fuel injection timing to optimize combustion efficiency	Check and adjust fuel injection timing based on engine specifications	 Investigate factors affecting injection timing and optimize settings
SFOC (Specific Fuel Oil Consumption)	High	4. Fuel quality issues	Use high-quality fuel and monitor fuel quality regularly	4. Implement a fuel quality monitoring program	Investigate factors affecting fuel quality and address them
SFOC (Specific Fuel Oil Consumption)	Low	1. Reduced load on the engine	Adjust vessel speed and power demand based on operational needs	Monitor load distribution and adjust throttle accordingly	Evaluate vessel load requirements and optimize engine operation
SFOC (Specific Fuel Oil Consumption)	Low	2. Improvements in combustion efficiency	Regular maintenance of fuel injectors, combustion chamber, and fuel system	Implement a regular maintenance schedule for fuel system components	Investigate factors affecting combustion efficiency and address them
SFOC (Specific Fuel Oil Consumption)	Low	3. Optimized fuel injection timing	Ensure the fuel injection timing is optimized for the engine's performance	Regularly check and adjust fuel injection timing based on engine specifications	 Investigate factors affecting injection timing and optimize settings
SFOC (Specific Fuel Oil Consumption)	Low	4. Use of high-quality fuel	Ensure the use of high-quality fuel and monitor fuel quality regularly	4. Implement a fuel quality monitoring program	Investigate factors affecting fuel quality and address them
Specific Cylinder Oil Consumption	High	1. Increased load on the engine	Optimize vessel speed and power demand based on operational needs	Monitor load distribution and adjust throttle accordingly	Evaluate vessel load requirements and optimize engine operation
Specific Cylinder Oil Consumption	High	2. Worn or damaged piston rings		Include piston ring inspection in routine maintenance tasks	Investigate factors contributing to piston ring wear and address them
Specific Cylinder Oil Consumption	High	3. Poor-quality cylinder oil	Use high-quality cylinder oil and monitor oil condition regularly	Implement regular cylinder oil quality checks	Investigate factors affecting cylinder oil quality and address them
Specific Cylinder Oil Consumption	Low	1. Reduced load on the engine	Adjust vessel speed and power demand based on operational needs	Monitor load distribution and adjust throttle accordingly	Evaluate vessel load requirements and optimize engine operation
Specific Cylinder Oil Consumption	Low	2. Well-maintained piston rings	Regularly inspect and maintain piston rings in good condition	Include piston ring inspection in routine maintenance tasks	Investigate factors contributing to well- maintained piston rings and optimize
Specific Cylinder Oil Consumption	Low	3. Use of high-quality cylinder oil	Ensure the use of high-quality cylinder oil and monitor oil condition regularly	3. Implement regular cylinder oil quality checks	Investigate factors affecting cylinder oil quality and address them
Torque Rich Index	High	Heavy weather conditions causing increased resistance	Adjust ship speed to avoid slamming in heavy seas	Be cautious of potential damage to stem and racing of propeller	Check for fouling and consider hull cleaning
Torque Rich Index	High	Potential slamming of the ship leading to propeller damage	Regularly check and clean hull and propeller as needed		
Torque Rich Index	Low	Calm weather conditions with lower resistance	Monitor and maintain normal ship speed in calm weather	Regularly check and clean hull and propeller as needed	Cleaner hull and propeller with lower resistance
Torque Rich Index	Low	Cleaner hull and propeller with lower resistance			
Turbocharger Average RPM	High	1. Increased engine load	Ensure the engine operates within the recommended load range	1. Monitor engine load conditions	Investigate and optimize engine load conditions
Turbocharger Average RPM	High	2. Excessive exhaust gas temperatures	Monitor and optimize engine combustion parameters	2. Check for abnormal combustion and misfiring	Investigate and diagnose combustion-related issues
Turbocharger Average RPM	High	3. Restricted air intake	3. Inspect and clean air filters	3. Monitor air filter condition	 Check for air filter restrictions and intake system integrity
Turbocharger Average RPM	Low	1. Insufficient engine load	Ensure the engine operates within the recommended load range	1. Monitor engine load conditions	1. Investigate and optimize engine load conditions
Turbocharger Average RPM	Low	2. Reduced combustion efficiency	2. Check and service fuel injectors	2. Monitor combustion parameters	Investigate and optimize combustion parameters
Turbocharger Average RPM	Low	3. Faulty or worn-out turbocharger components	Perform a visual inspection of the turbocharger components	Inspect turbocharger components for wear and damage	Conduct a thorough inspection of the turbocharger components
Turbocharger Average RPM	Low	4. Heat exchanger fouling or scaling	Perform chemical cleaning of heat exchanger surfaces	4. Inspect for leaks in the heat exchanger	Check and maintain heat exchanger components
Variable Injection Timing	High	Advanced injection timing for high load conditions	Verify engine load and adjust injection timing accordingly	Monitor engine load and adjust timing as needed	Optimize injection timing for specific load conditions
Variable Injection Timing	High	2. Faulty VIT control mechanism	Inspect and repair or replace VIT control components	Check for abnormal sounds during VIT operation	Diagnose and address issues with VIT control components
Variable Injection Timing	Low	Retarded injection timing for low load conditions	Verify engine load and adjust injection timing accordingly	Monitor engine load and adjust timing as needed	Optimize injection timing for specific load conditions
Variable Injection Timing	Low	2 Faulty VIT control mechanism	2. Inspect and repair or replace VIT control components	Check for abnormal sounds during VIT operation	Diagnose and address issues with VIT control components
Vessel Speed	High	1. Increased power demand for higher speed	Verify navigation requirements and adjust speed	Monitor power demand and adjust throttle accordingly	Evaluate navigation needs and vessel speed capabilities
Vessel Speed	High	2. Engine propulsion system operating correctly			
Vessel Speed	Low	1. Reduced power demand for lower speed	Verify navigation requirements and adjust speed	Monitor power demand and adjust throttle accordingly	Evaluate navigation needs and vessel speed capabilities
Vessel Speed	Low	2. Engine propulsion system operating correctly			