**1. SPARKS FROM THE FUNNEL**

**CAUSES:**

* It can be caused by too much after burning or poor combustion.
* In case the exhaust temperature is too high, there could be a soot fire.

**REMEDIAL ACTION:**

Check fuel oil temperature and scavenge temperatures. Drain the fuel oil tanks. A Dirty economizer should be soot blown and water washed when the engine is stopped.

**2. TOO MUCH SPARKING FROM THE FUNNEL**

**CAUSES:**

* If the exhaust gas temperatures are too high  in addition to heavy sparking at the funnel, there is a possibility of a fire at the economizer or a scavenge fire.

**REMEDIAL ACTION:**

Stop the engine, but do not run at low loads since un burnt fuel is more at low loads. Start the standby economizer water circulating pump to increase cooling. Provide boundary cooling. Stop the engine & shut the air inlets at the turbocharger and auxiliary blowers.

**3. CYLINDER RELIEF VALVE LIFTING UP**

**CAUSES:**

* This can be due to excess fuel supplied during starting or maneuverings
* Accumulated or un burnt fuel igniting with excess air
* A sudden increase in load in rough weather
* Pre-ignition
* Leaking or sticking air start valves
* Water or oil accumulation on the piston crown
* Excessive peak pressures.

**REMEDIAL ACTION:**

Identify cause and take corrective action. Please note B&W design aspect of the relief valve. Cylinder heads nuts may have to be re-tightened prior to starting after excess pressure relief.

**4. CYLINDER RELIEF VALVE LIFTING DURING BLOW THROUGH**

**CAUSES:**

* Choked indicator cock.
* An incorrect relief valve setting.
* Water accumulation in the combustion chamber.
* Excess water in the starting air.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**5. SMOKY EXHAUST**

**CAUSES:**

* Less air supply to the engine due to fouled gas or air side of the turbocharger.
* Overloaded running conditions. Check load indicator, exhaust temperatures and peak pressures.
* Excessive cylinder lubrication.
* Injection nozzles not atomizing the completely, e.g. due to carbon trumpet formation & eroded or blocked spray holes.
* Incorrect fuel temperatures/viscosity, or a shift in the individual fuel cams.
* Compression pressure too low due to leaking piston rings/exhaust valve.
* Too low turbocharger rpm.
* Scavenge fire.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**6. ALL CYLINDERS EXHAUST TEMPERATURE INCREASE**

**CAUSES:**

* This can occur because of fouling in turbocharger, air cooler, and intake air filter, scavenge valves in the air receiver, scavenge ports or exhaust passages
* Incorrect fuel timings, bad quality fuel/inadequate fuel treatment also result in increased temperatures

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**7. ONE UNIT EXHAUST TEMPERATURE RISE**

**CAUSES:**

* Thermometer defective (local or remote).
* Less air supply due to the individual unit scavenge valves in the air receiver or scavenge ports fouled, or a scavenge fire.
* Fuel injector nozzle in a poor condition or the tip broken.
* Incorrect fuel timings or a fuel cam shift.
* Leaking exhaust valve.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**REMARKS:**

ME Auto Slow Down as deviation alarm is triggered to safeguard effects of an imbalanced engine.

**8. ENGINE SPEED DROPS**

**CAUSES:**

* Fuel pressure after the booster pump is too low.
* Fuel pumps defective or a fuel piping fault.
* Incorrect fuel injection.
* Fouling of air or exhaust passages.
* Fuel air lock, gassing, water in the fuel, or poor fuel combustion.
* Scavenge fire.
* Governor problem.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**REMARKS:**

Auto slow down will be triggered in case of Scavenge Fire, Oil Mist Detector alarm & EGB high temperature.

**9. ONE UNIT EXHAUST TEMPERATURE DROPS**

**CAUSES:**

* A faulty thermometer.
* Less fuel supplied due to faulty fuel injection pump, pipes, injector or timings, a shift in cam position, broken piston rings.
* Exhaust valve does not open due to the malfunctioning of the actuating system.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**REMARKS:**

ME Auto Slow Down as deviation alarm is triggered to safeguard effects of an imbalanced engine.

**10. ENGINE RUNNING IRREGULARLY, MISFIRING OR CUTTING OUT**

**CAUSES:**

* Fuel problems like faulty fuel booster pump or fuel pump, wrong fuel pressure or temperature, air lock or water in fuel, or a defective fuel valve.
* Governor malfunction.
* Turbocharger surging.
* Running gear components over heated, causing severe alternating friction.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**REMARKS:** ME Auto Slow Down as deviation alarm is triggered to safeguard effects of an imbalanced engine.

**11. JACKET WATER PRESSURE FLUCTUATION**

**CAUSES:**

* Air pockets in the jacket cooling water, or insufficient venting.
* Exhaust gas leaking into jacket cooling water due to a crack in the liner, cylinder head or valve cage.
* Drop in the static pressure at pump inlet, due to throttling in the return pipe line.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**12. JACKET WATER TEMPERATURE INCREASE**

**CAUSES:**

* Valves may be shut or in sufficient venting.
* Overloaded engine or piston running hot.
* Crack in the liner, cylinder head or exhaust valve cage.
* Temperature controller malfunction.
* Jacket cooler setting is wrong.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**13. ENGINE FAILS TO START ON AIR**

**CAUSES:**

* Low air bottle pressure or air line valves may be shut.
* Air bottle isolating valve or automatic valve or distributor malfunction.
* Control air valves faulty/less control air pressure.
* Start air automatic valve jammed.
* Turning gear engaged or limit switch faulty.
* Reversing has not taken place completely.
* Control valve for fuel/start is not in its end position.
* Bursting diaphragm on start air line damaged.
* Fuel lever on the manoeuvring stand not on remote mode.
* Not sufficient spring air pressure to shut exhaust valve, thereby causing loss of compression.
* Auxiliary blower not running/not on auto mode.
* No oil pressure due to exhaust valve being open or insufficient spring air pressure.
* Start air distributor not activated its end stop valves.
* Start air distributor piston is sticking.
* Start air distributor is wrongly adjusted.
* Start air distributor control valve is sticking.
* Cylinder air start valves are defectives or sticky.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**14. ENGINE TURNS ON AIR, BUT NOT ON FUEL**

**CAUSES:**

* In B & W engines, the puncture valves are not properly vented.
* Fuel regulating linkage jammed or held back by the stop cylinder.
* Fuel lever on the local maneuvering stand is not on remote mode.
* Governor is defective & does not release the fuel linkage, or there is no boost air to the governor.
* Rotary valve of rotation direction safeguard is sticking.
* Shut down of fuel pumps.
* Fuel filter is blocked or the fuel pump index is too low.
* Pre-set control air signal to the governor is too low.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**15. ENGINE DOES NOT FIRE**

**CAUSES:**

* Less fuel being injected or the speed setting knob is set too low.
* Governor does not release the regulating linkage.
* VIT & FQS functions are too late.
* Start air pressure is insufficient to turn engine fast enough.
* Fuel is unsuitable or its viscosity high.
* Compression pressure is too low due to faulty piston ring sealing or the exhaust valve closing.
* Fuel pump defect.
* Injector nozzle needle sticking or holes blocked.
* Suction or spill valves leaking or struck.
* Pump push rods jammed or the fuel cams displaced or incorrect timings.
* Fuel pump relief valve leaking.

**16. BROKEN PISTON RING**

**CAUSES:**

* Excessive thermal load, insufficient cooling, or a distorted piston crown.
* Excessive piston ring clearance or distorted grooves.
* Sticking of piston rings or incompatible materials.
* Excessive lubrication or loss of lubrication.
* Collapse of piston rings.

**EFFECTS:**

* Loss of compression.
* Blow past of combustion gases.
* Scavenge fire.
* Scuffing of the cylinder liner.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**17. BEARING TEMPERATURE INCREASE**

**CAUSES:**

* Low lube oil pressure supply to bearing or low oil level in supply tank.
* Air lock in the lube oil or the lubricating grooves obstructed.
* Oil piping defective or lube oil valves shut.
* Lube oil contains water or metal impurities.
* Excessive bearing clearances, excessive wear or important tightening.

**18. LUBE OIL SUMP LEVEL RISING**

**CAUSES:**

* Pitching, rolling or changes in cargo loading.
* Water leakage from piston cooling or jacket water system.
* Lube oil purifier wrongly set.
* Transfer pump valves wrongly lined up.
* Lube oil inlet line valve of the storage tank may be open.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**19. AUTOMATIC STOPPING OF THE ENGINE**

**CAUSES:**

* Activation of safety shut down or over speed cut-out device.
* Control air pressure in the shut-down servomotor too low, causing pressure to pull the fuel linkage back to zero.
* Governor defective.
* Fuel supply stopped due to the clogged filter or empty tank or air lock.

**REMEDIAL ACTION:**

Identify cause and take corrective action.

**20. REDUCED COMPRESSION PRESSURE**

**CAUSES:**

* This is due to worn piston rings.
* Worn liner.
* Worn piston crown.
* Worn exhaust valve.
* Incorrect exhaust valve timings
* Identify cause and take corrective action.

**REMEDIAL ACTION:** Identify cause and take corrective action.