

Item	No.	Name	Interval	Action	Influence on main engine at the malfunction
1) HPS	①	Hydraulic oil pump	32,000hrs	Maintenance by maker or Replacement	Decrease in engine load by the malfunction of two or more units. (Fuel index is restricted by the HPS limiter)
	②	Proportional valve	20,000hrs	Replacement	Can't supply High-pressure oil for AS direction due to the malfunction two or more units. (Because Pump output becomes fixed setting on AH MAX)
	③	Accumulator: N2 gas	3,000hrs	Check/Re-charge	Hard pulsation of hydraulic pressure.
:Membrane		32,000hrs	Replacement	Hard pulsation of hydraulic pressure.	
2) Accumulator block for HPS	①	Pressure relief valve	32,000hrs	Overhaul Maintenance	Can't relieve hydraulic pressure when shutdown.
	②	Pressure transmitter	32,000hrs	Replacement	Shutdown by the malfunction of three units.
3-1) HCU (Hydraulic cylinder Unit)	①	Accumulator: N2 gas	3,000hrs	Check/Re-charge	Slowdown(The abnormal movement of FO plunger or Exh valve stroke occurs by hard pulsation of hydraulic pressure.)
		:Membrane	32,000hrs	Replacement	Slowdown (The abnormal movement of FO plunger or Exh valve stroke occurs by hard pulsation of hydraulic pressure.)
	②	FIVA valve	32,000hrs	Maintenance or Replacement	Slowdown
	③	High pressure hose	32,000hrs	Replacement	Slowdown (by leakage detection)
3-2) Fuel oil pressure booster	⑤	Seal rings	32,000hrs	Replacement	Slowdown (An abnormal of FO pump occurs)
	⑥	Stroke sensor	64,000hrs	Replacement	Slowdown
	⑦	Suction valve	based on function condition	Replacement	An deviation of cylinder pressure, deviation of exhaust gas temperture.
	⑧	Throttle valve	based on function condition	Replacement	An abnormal of Pmax, deviation of exhaust gas temperture.
3-3) Exh.valve driving actuator	⑥	Seal rings	32,000hrs	Replacement	An abnormal of Pcomp, deviation of exhaust gas temperture..
	⑦	Non-return valve	based on function condition	Replacement	Slowdown (An abnormal of Exh.valve occurs.)
	⑧	Stroke sensor	64,000hrs	Replacement	Slowdown
3-4) Alpha lubricator	③	Solenoid valve	32,000hrs	Replacement	Slowdown (no lubrication)
	④	Seal rings	64,000hrs	Replacement	Possibility of wearndown of cylinder liner. (BN decreases due to that Svsstem oil is mixed into cylinder oil.)
	⑤	Feedback sensor	64,000hrs	Replacement	Slowdown(Can't lubricate)
4) Tacho system	①	Angle encoder	64,000hrs	Replacement	The same phenomenon occurs with the camslip in the malfunction of two encoders.
	②	Marker sensor	32,000hrs	Replacement	It has no effect on the operation.(Alarm for deviation detection function)
5) Start-up Pump	①	Gear pump	32,000hrs	Replacement	Main engine can't start due to the malfunction of two units.
	②	Electric motor	32,000hrs	Replacement	Main engine can't start due to the malfunction of two units.
	③	Claw Coupling	32,000hrs	Replacement	Main engine can't start due to the malfunction of two units.
6) Solenoid Valve for starting valve		Solenoid valve	32,000hrs	Overhaul Maintenance	Can't supply starting air to a malfunctioned cylinder.
7) MOP (Main operating panel)		MOP-A,B	64,000hrs	Replacement	It has no effect on the operation. (Can't supervise and change the parameter by a crew.)
8) MPC (Multi Purpose controller)	①	MPC circuit board	64,000hrs	Replacement	Main engine can't start due to a malfunctioned board (Both ECU-A and ECU-B is malfunctioned.etc.)
	②	Battery in MPC	16,000hrs	Replacement	It has no effect on the operation. For keeping the time in the board, only alarm
	③	MPC10 circuit board	64,000hrs	Replacement	Slowdown (Back up lubrication should be used until the restoration)