

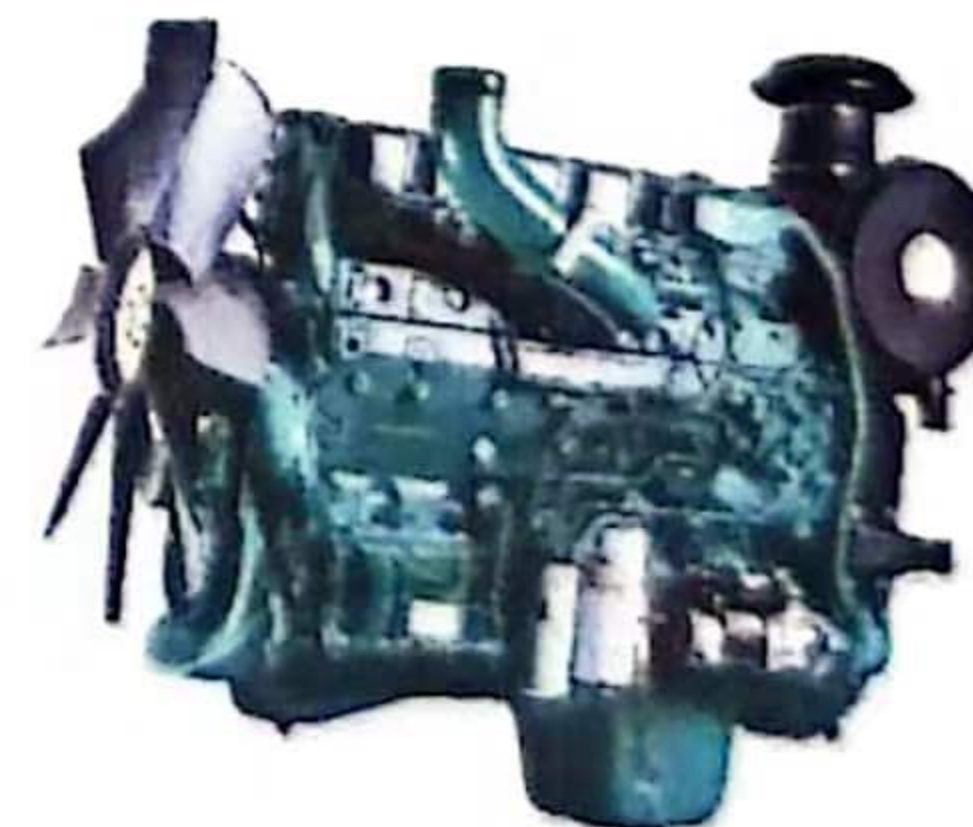
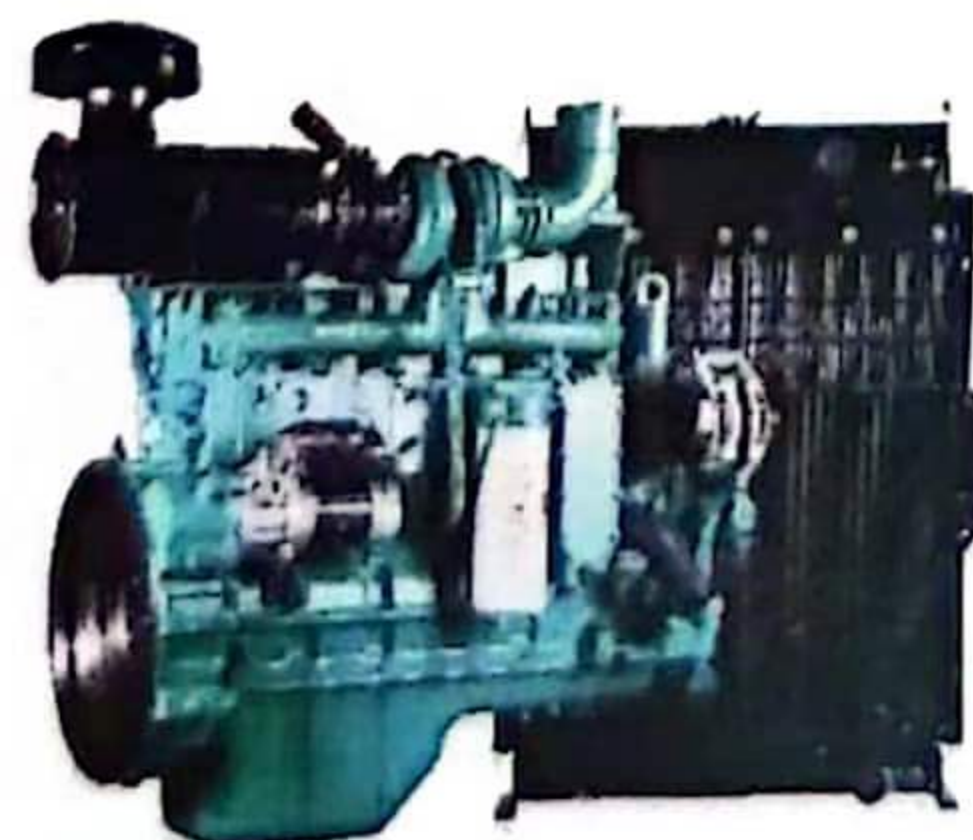
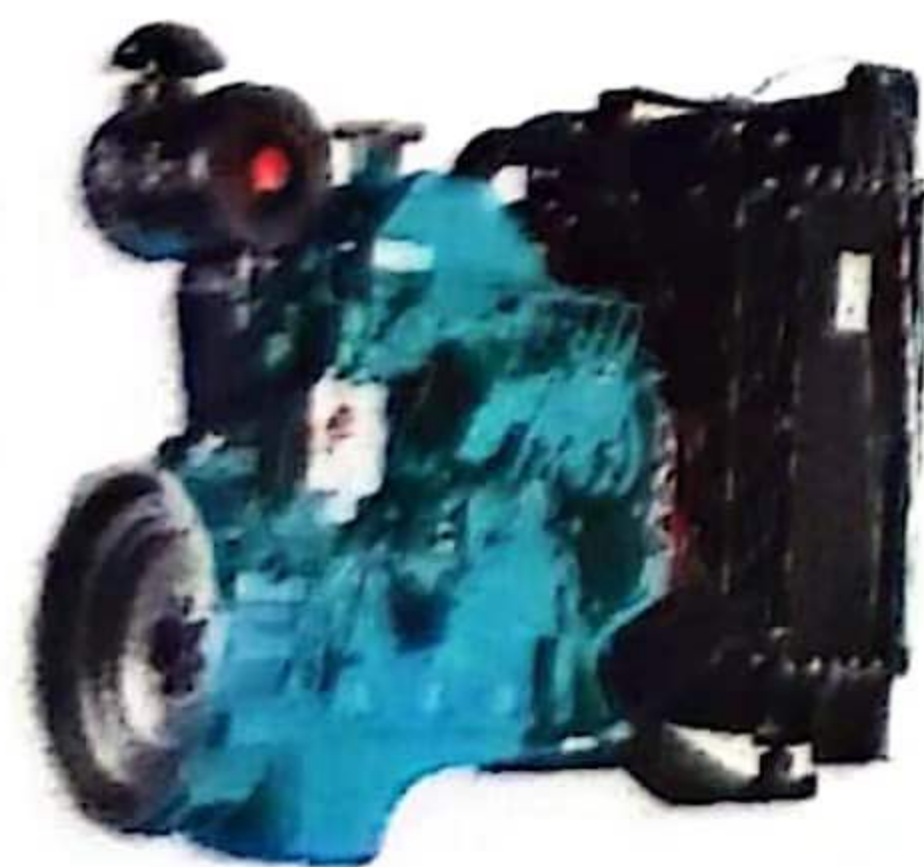
## Product introduction

■ Provide customers with a complete set of power packs suitable for generator set application. All power pack components are designed and validated in accordance with CUMMINS design and development standards. The products include:

■ Cooling system: mainly include radiator and pipe assembly. Provide customers with radiators suitable for high temperature, extreme cold, high altitude, high corrosion and other special environments.

■ Speed control system: mainly include speed controllers and ECM electronic control module. Provide customers with a variety of speed regulation schemes to meet the operating requirements of different levels of power station.

■ Air intake system: mainly include air filter and its pipeline. Twin-stage filter element is adopted and the filtration efficiency is up to 99.5%, which can prevent the abnormal engine wear and provide customers products suitable for the special environment of high altitude, high dust and high humidity.



## Introduction

■ This manual introduces the B, C, L, Z series engine use and precautions, engine maintenance. Only strict compliance with the use and maintenance specifications, it can ensure the normal use of the engine. Please read this manual carefully before using the engine. Use fuel oil, lubricating oil and coolant that meet the requirements of the specification in accordance with the technical specifications. When replacement parts are required, it is recommended that Cummins genuine accessories must be used.

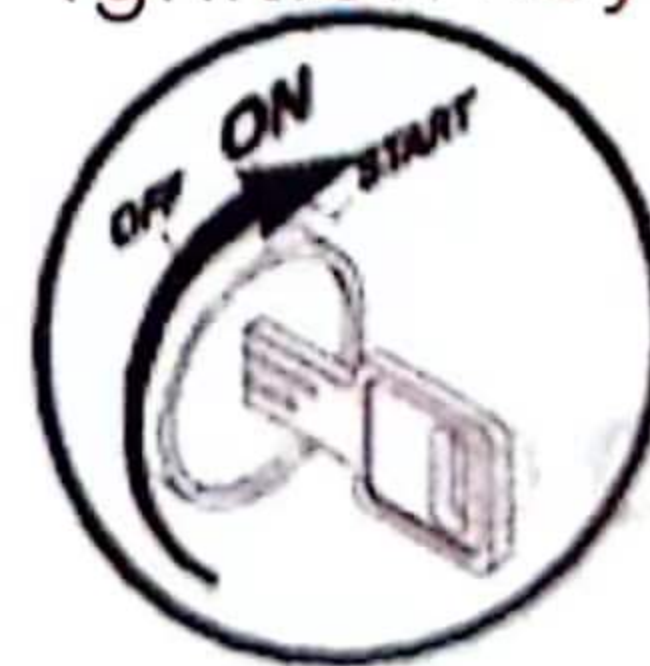
■ During operation, the following engine conditions should be paid close attention to. If any item appears suddenly, it is likely to be a sign of trouble, please check and repair it in time.

- Poor engine start or stop
- Abnormal vibration
- Abnormal noise
- Heavy exhaust smoke
- Sudden change of working pressure and temperature
- Underpower
- High oil consumption
- High fuel consumption
- Fuel, oil or water leakage

## Correct engine start

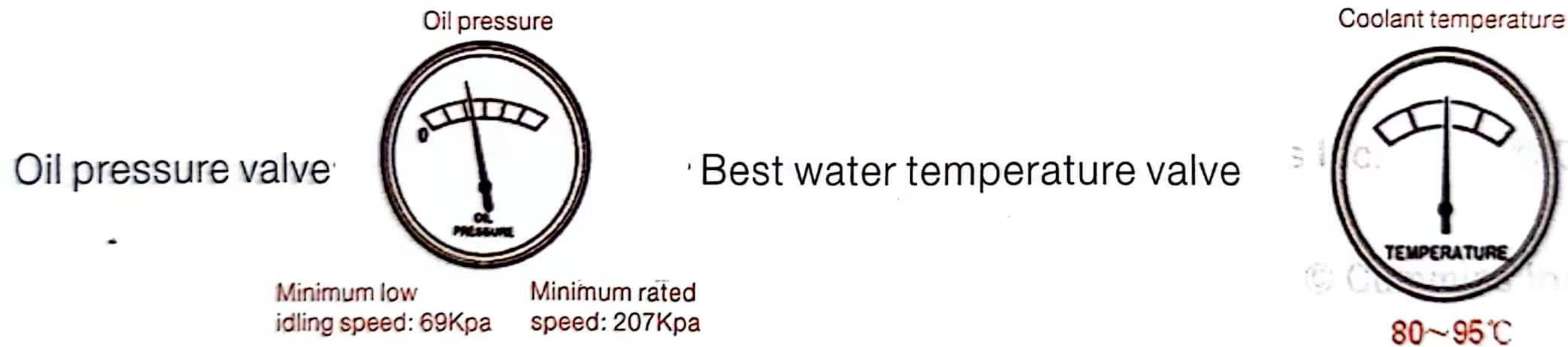
- Ensure safe and reliable engine operating environment and that all parts are securely connected.
- Check the coolant level and oil gauge before starting for the first start, and drain off the water from the oil-water separator.
- Make sure the belt fan is free from interference damage and the intake and exhaust system is free from abnormality.
- Starter starting time can't be exceed 15 seconds. Continuous start interval is 2 minutes. If the engine fails to start three times in a row, the fuel system should be checked first.
- After starting the engine, observe the change of oil pressure within 15 seconds. If oil pressure has no display or is below 69KPa within 15 seconds, stop immediately to avoid engine damage.
- After daily first starting the engine, warm up 3 to 5 minutes at low speed. It must start warming-up the engine when the temperature is lower than 0°C . Ensure engine parts are adequately lubricated and oil pressure is stabilized.
- Start the engine after passing inspection.

Ignition key



## Correct engine operation

- Please don't make the engine idle running time for too long. Idle running time for too long (more than 5 minutes) may damage the engine.
- Check oil pressure, coolant temperature and other engine parameters through the gen-set control panel to ensure proper engine operation. If there is alarm information on the panel, please take measures to correct the alarm status.
- Check the oil pressure gauge and coolant temperature gauge frequently. If the pressure or temperature does not meet the technical specifications, stop the machine immediately.



- Continuous operation of the engine below 60 °C or higher than 100 °C of the coolant temperature will damage the engine.
- Avoid engine overload or long time no-load operation, such behaviors are considered to be improper engine use.

## Add coolant correctly

■ The coolant should not be added too quickly, otherwise the air in the engine water jacket is not easy to discharge, resulting in the engine running temperature is too high.

After the coolant is full filled, shut down for inspection after thermal engine, and refill until the coolant is full filled.

If the engine is equipped with an intercooler, the air release valve on the water cooler must be opened during refueling.

Specification	Color	Ambient temperature °C	Proportion	Pondus hydrogenii value
-50	Blue	-50	1.070~1.060	7.5~9
-40	Blue	-40	1.060~1.055	7.5~9
-35	Blue	-35	1.055~1.050	7.5~9
-30	Blue	-30	1.050~1.040	7.5~9
-20	Red	-20	1.030~1.035	7.5~9
-10	Red	-10	1.020~1.025	7.5~9

- Remind:  
Notes to users that the coolant must be added as required, otherwise the engine will be damaged.
- Warning:  
The engine cooling system must be filled with long-term organic coolant.  
Ethylene glycol or propylene glycol.

- Reminder: Replacement cycle of rust-proof antifreezing solution is two years.  
In winter, must check the concentration of rust-proof antifreezing solution.  
The cooling system of the used engine should be cleaned before using rust-proof antifreezing solution.  
It is strictly prohibited to use water instead of rust-proof antifreezing solution.

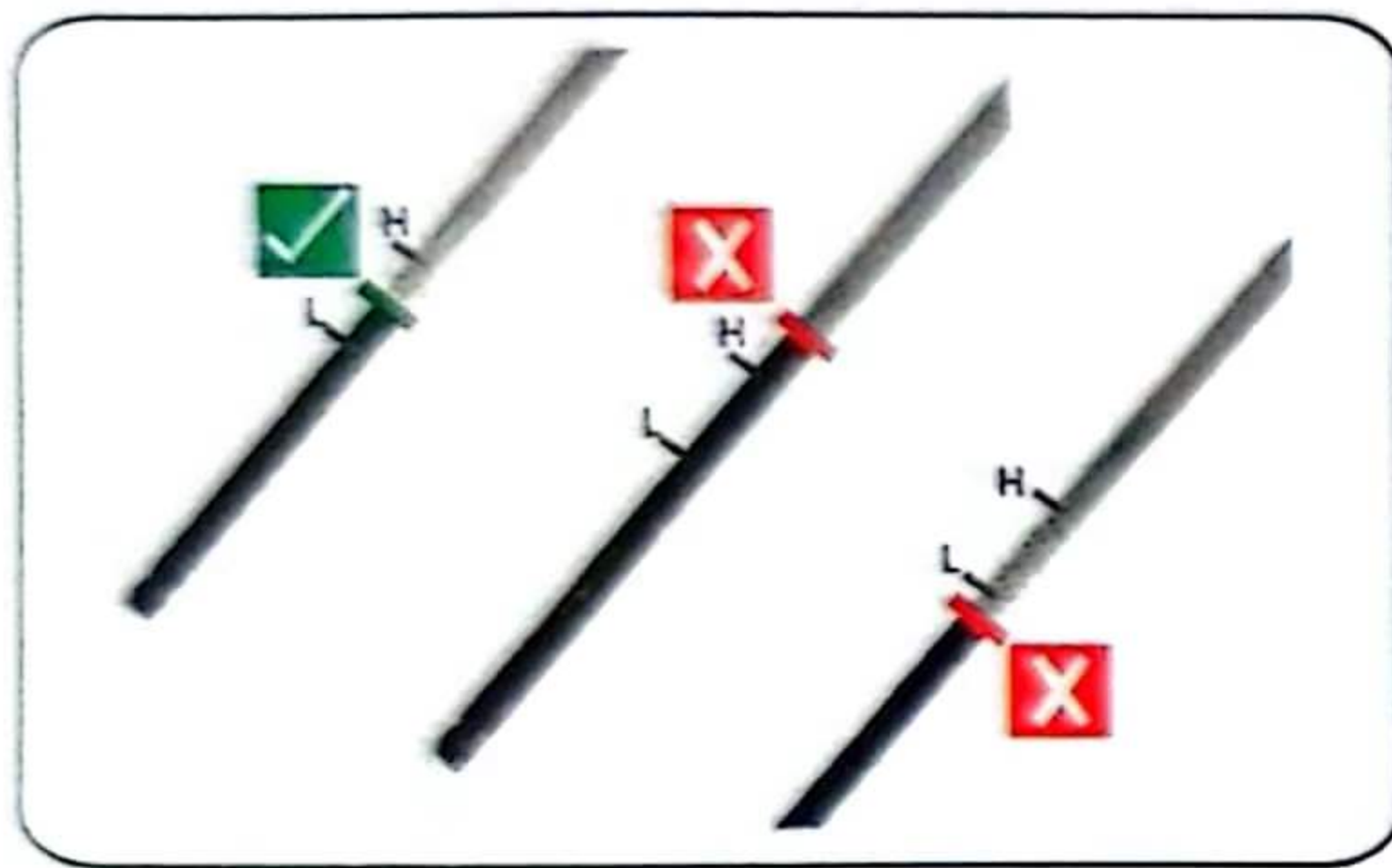
## Important maintenance content assist of engine

Item	Technical requirements	Maintenance period	Range of application
Change engine oil	CH-4	400 hours, 4 months (whichever comes first)	Whole series engine
Change engine oil filter	designated brand	400 hours, 4 months (whichever comes first)	Whole series engine
Change fuel filter	designated brand	400 hours, 4 months (whichever comes first)	Whole series engine
Change cooling liquid	Long-acting organic	2000 hours, 24 months (whichever comes first)	C/L/Z series engine
Change cooling liquid	Long-acting organic or inorganic	2000 hours, 24 months (whichever comes first)	B/D series engine
Air filter	designated brand	Clean up every 100 hours and replace every 500 hours (cycle halved in harsh conditions, such as high temperature, dustiness and damp)	Whole series engine

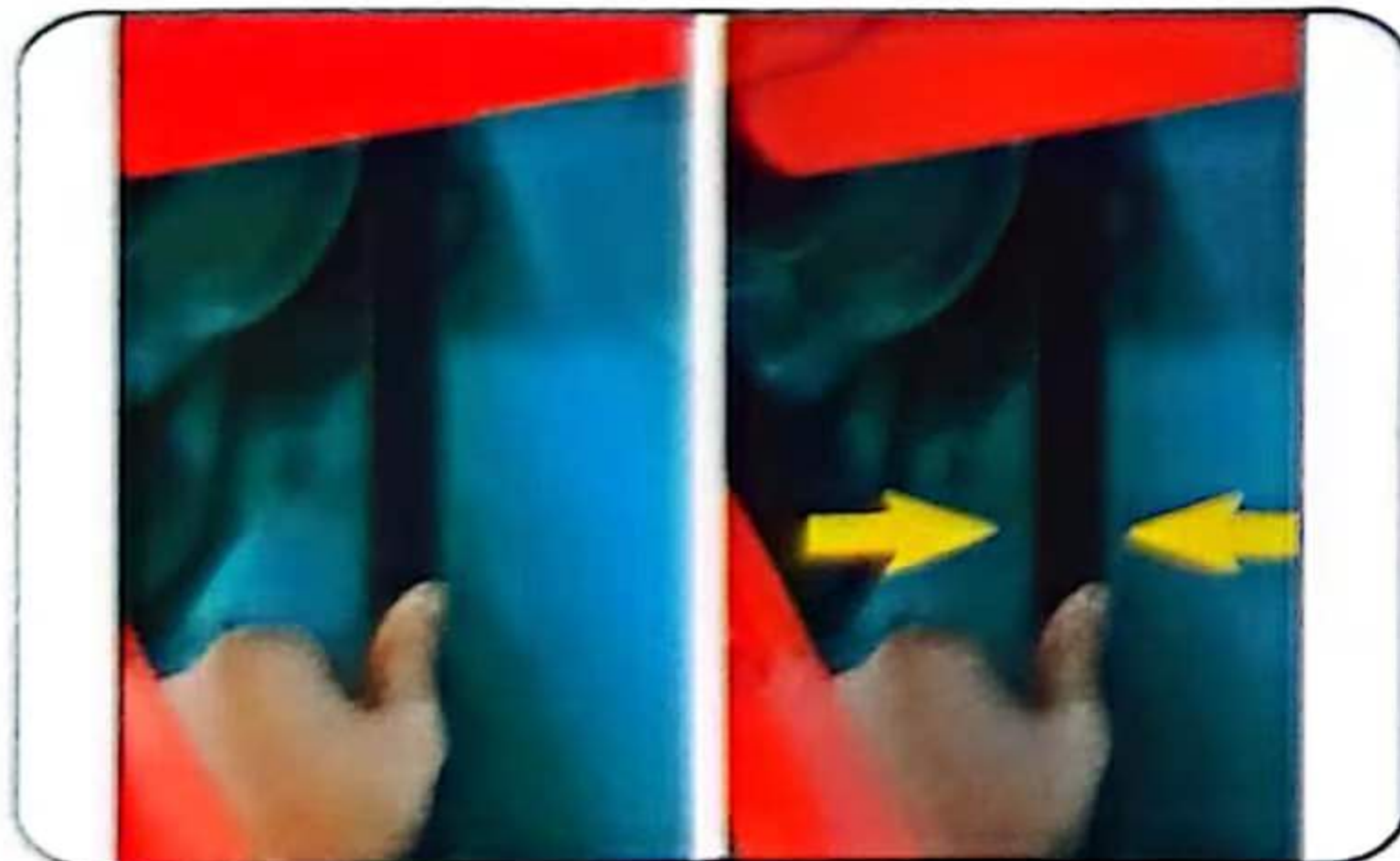


## Maintenance specifications(daily check)

- Check oil level



- Check whether the drive belt is damaged and adjust the tension



- Check coolant level



- Check the admission line for any pipeline damage or loose clamp



- Check air filter resistance indicator



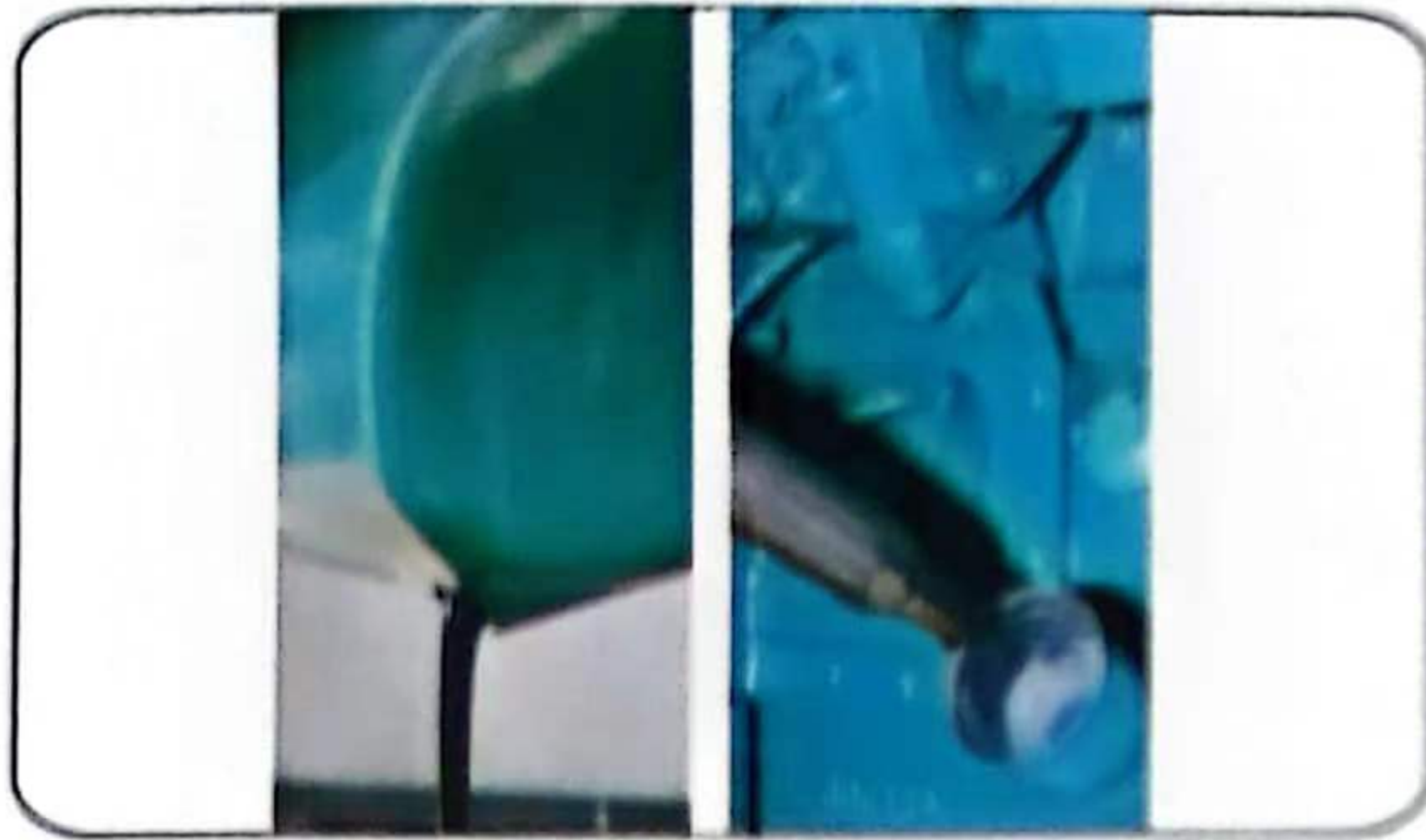
- Drain the water from fuel/water separator until clean fuel is seen





## Maintenance specifications (every 400 hours or 6 months)

- Change engine oil



- Change oil-water separator and fuel filter



- Change engine oil filter

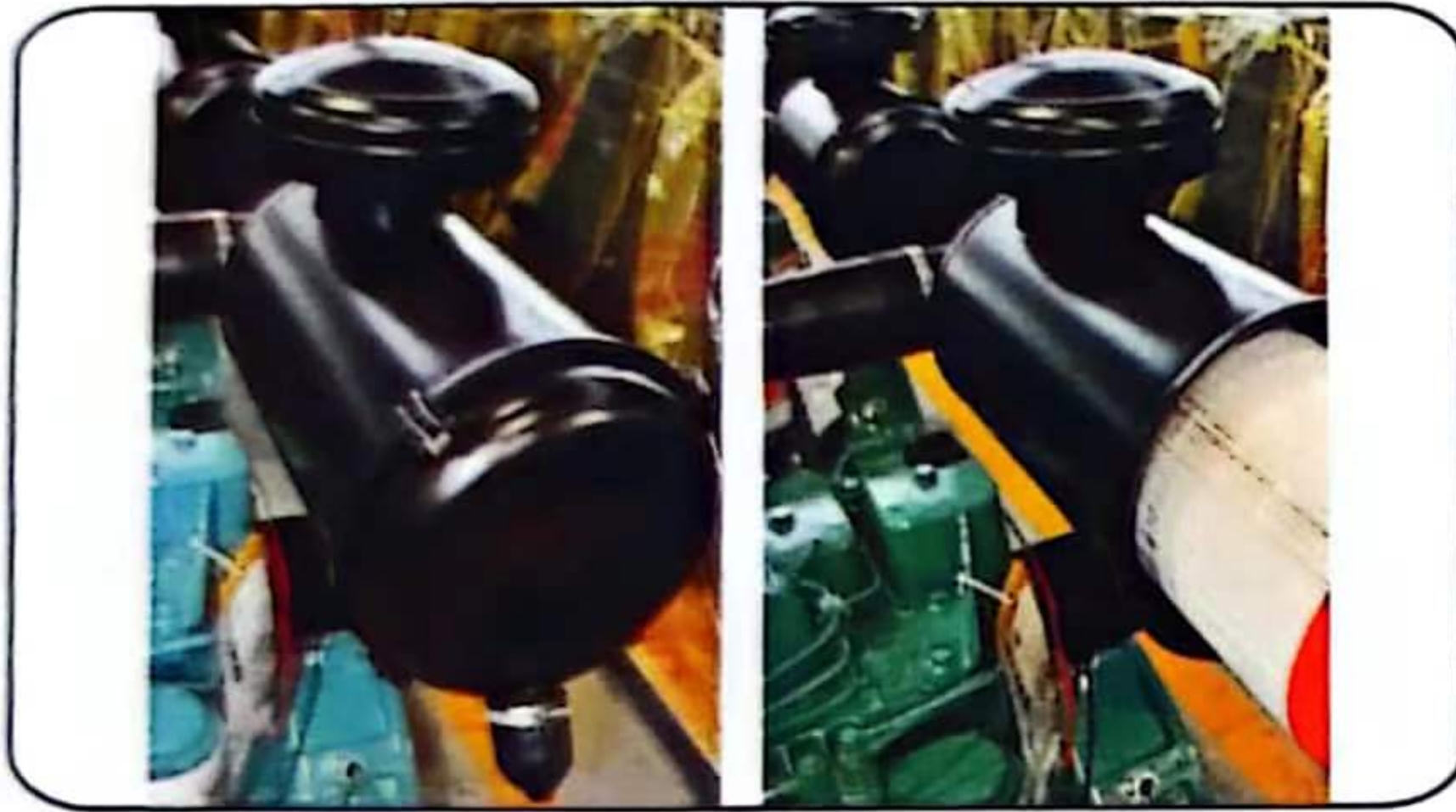


- Replace the primary fuel filter

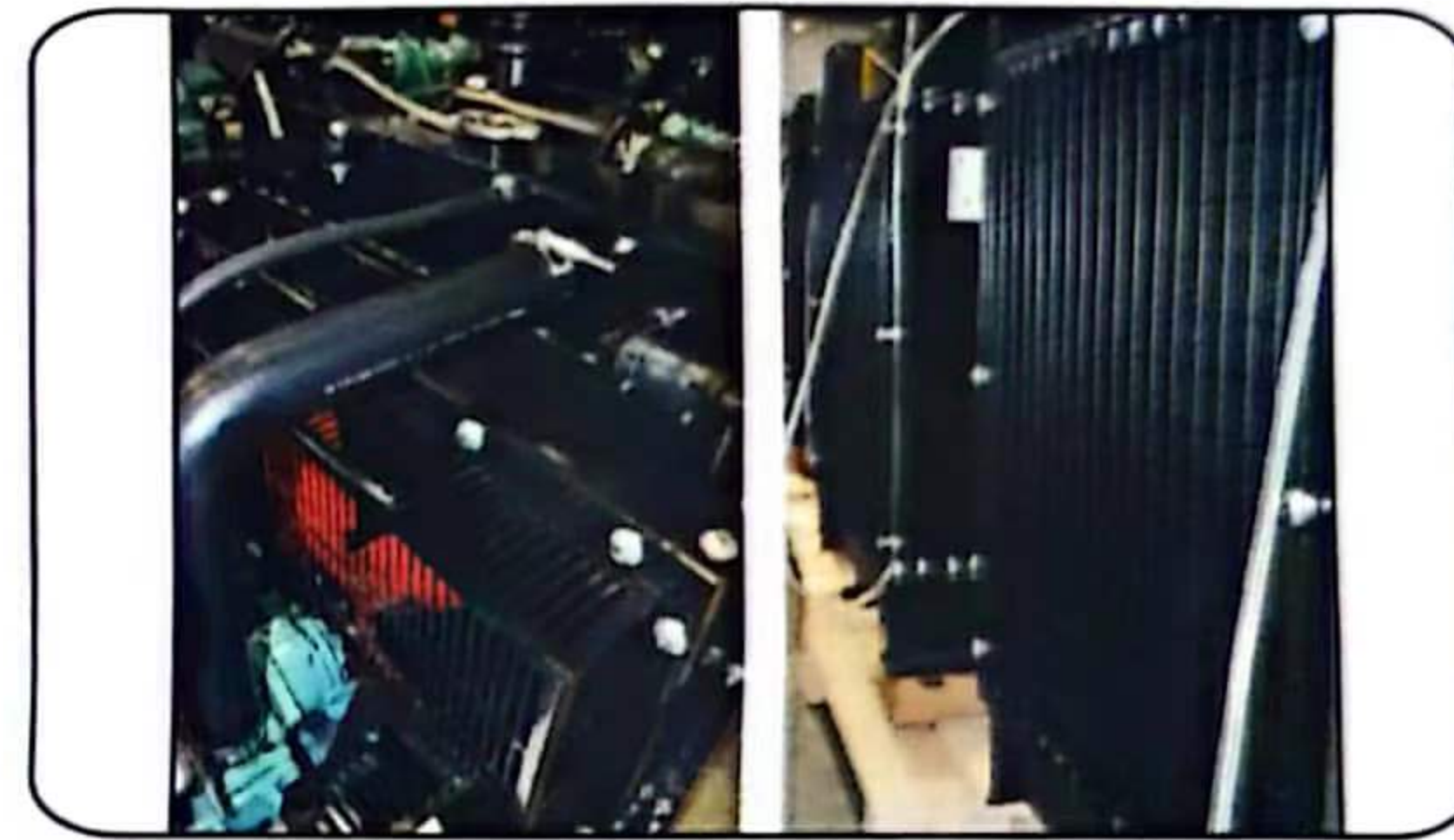


## Maintenance specifications (every 400 hours or 4 months)

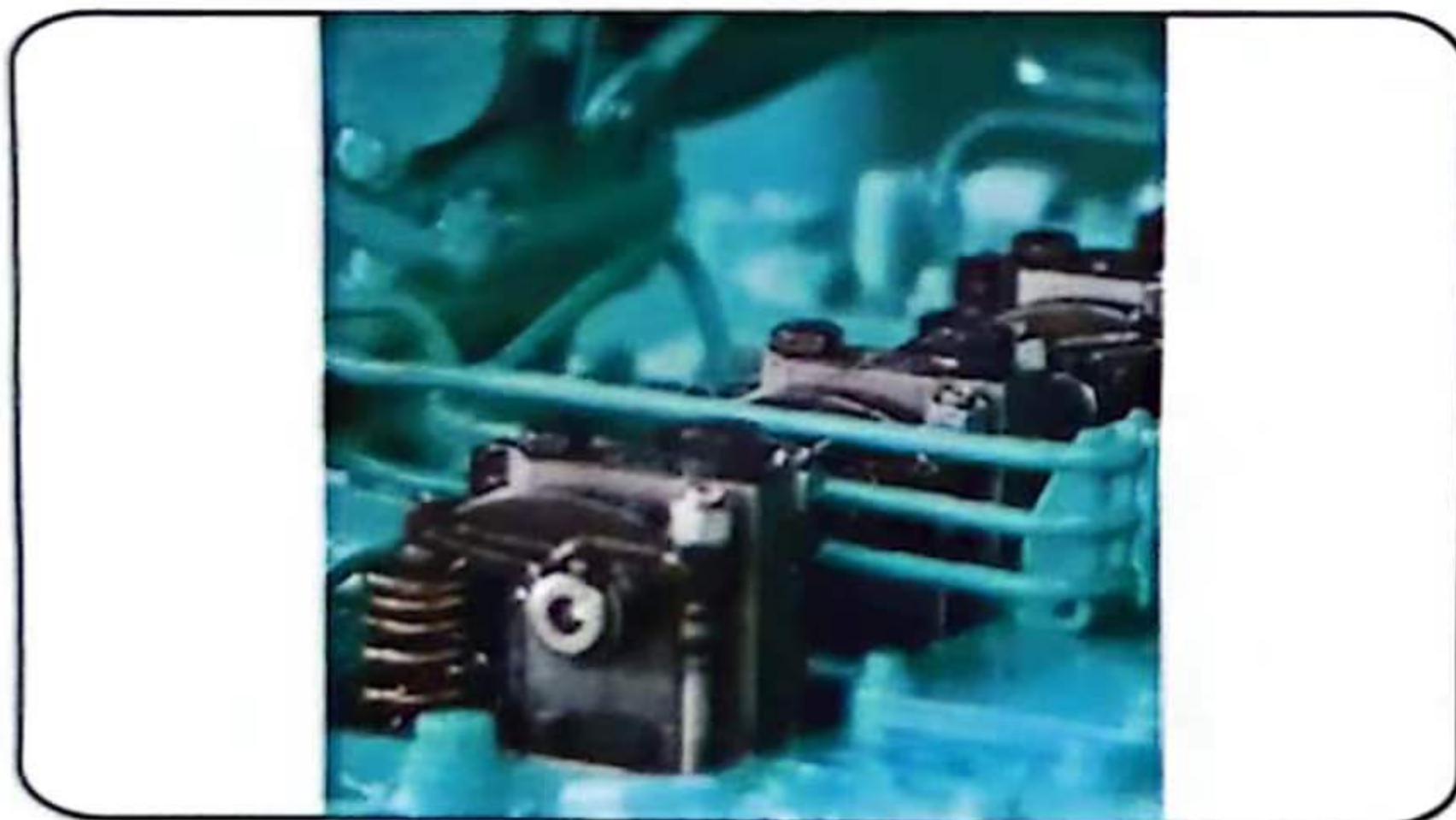
- Check air intake system and air filter and see if the filter element needs to be cleaned or replaced



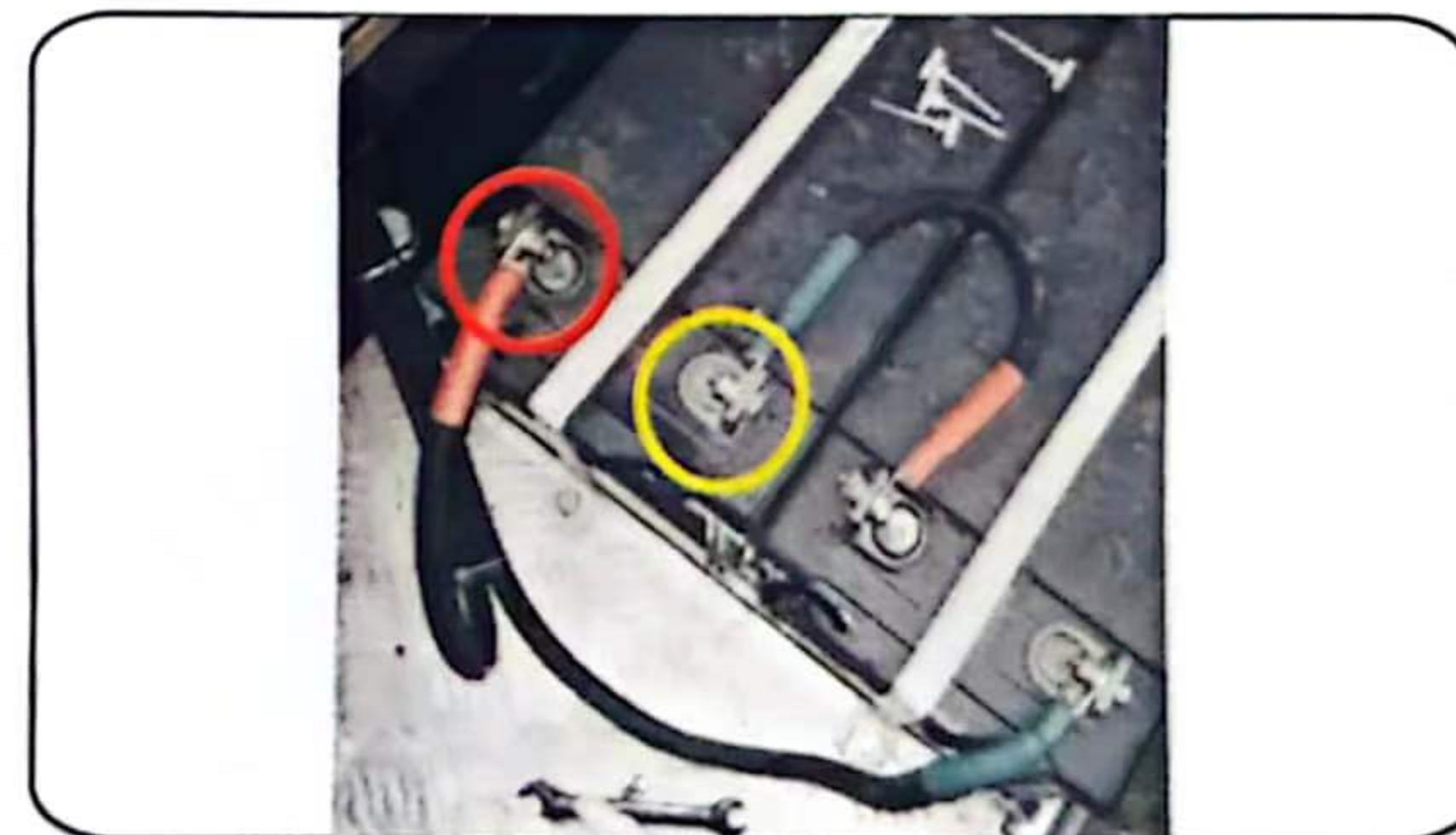
- Check cooling system and intercooler to see whether the line is broken and leaking or the radiator needs to be cleaned



- Check and adjust valve clearance

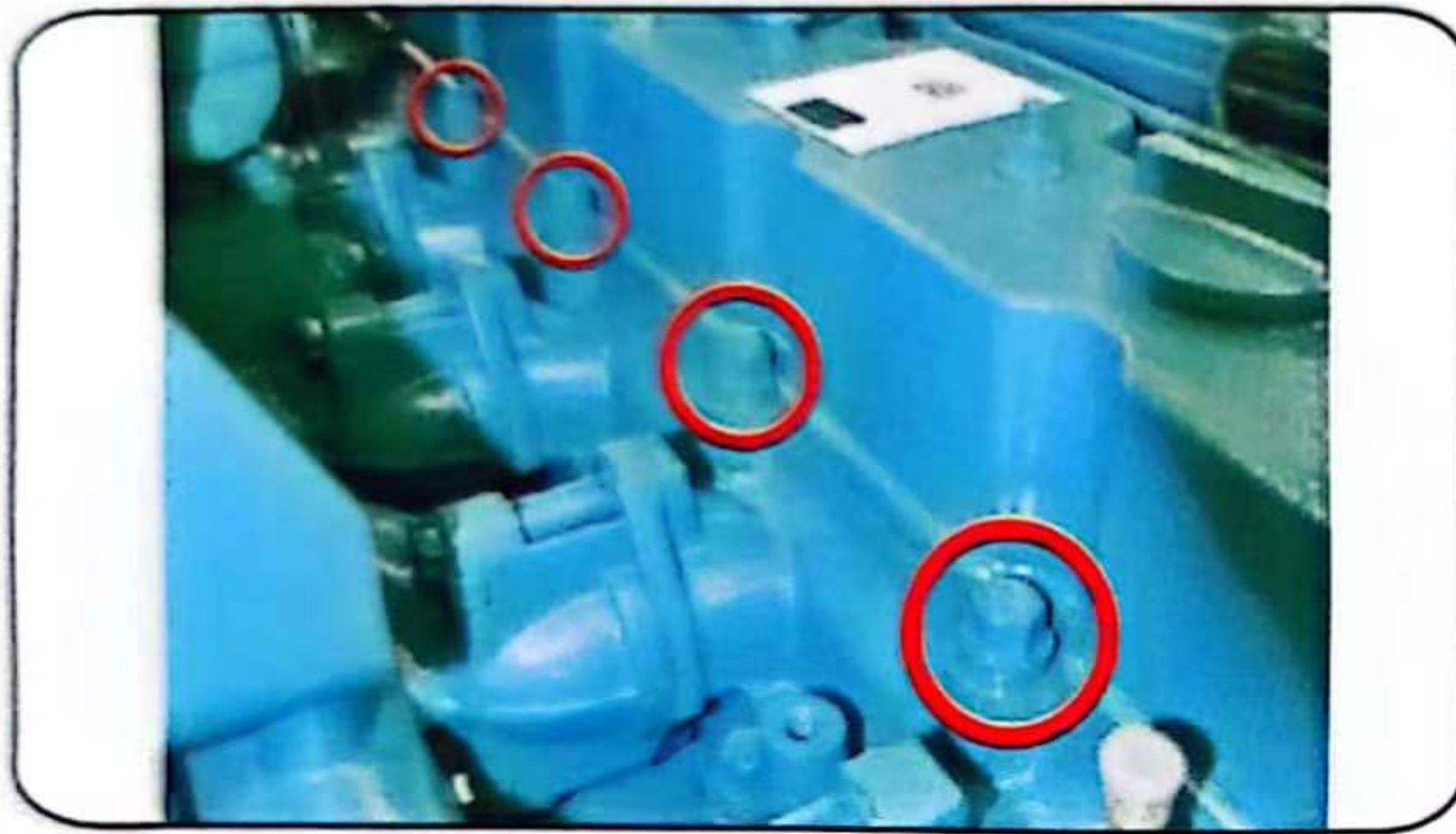


- Check storage battery and cable connector

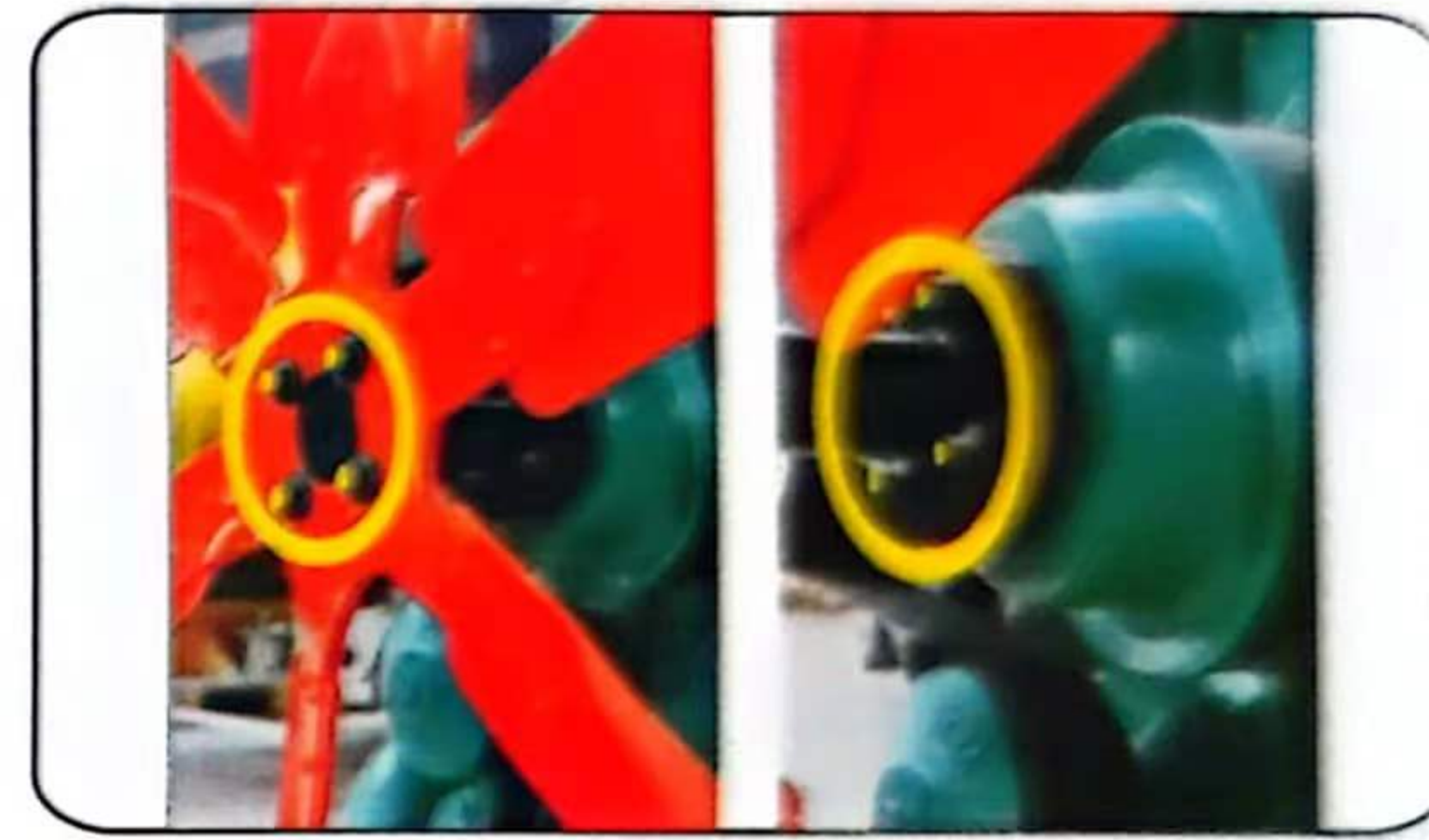


## Maintenance specifications (every 800 hours or 8 months)

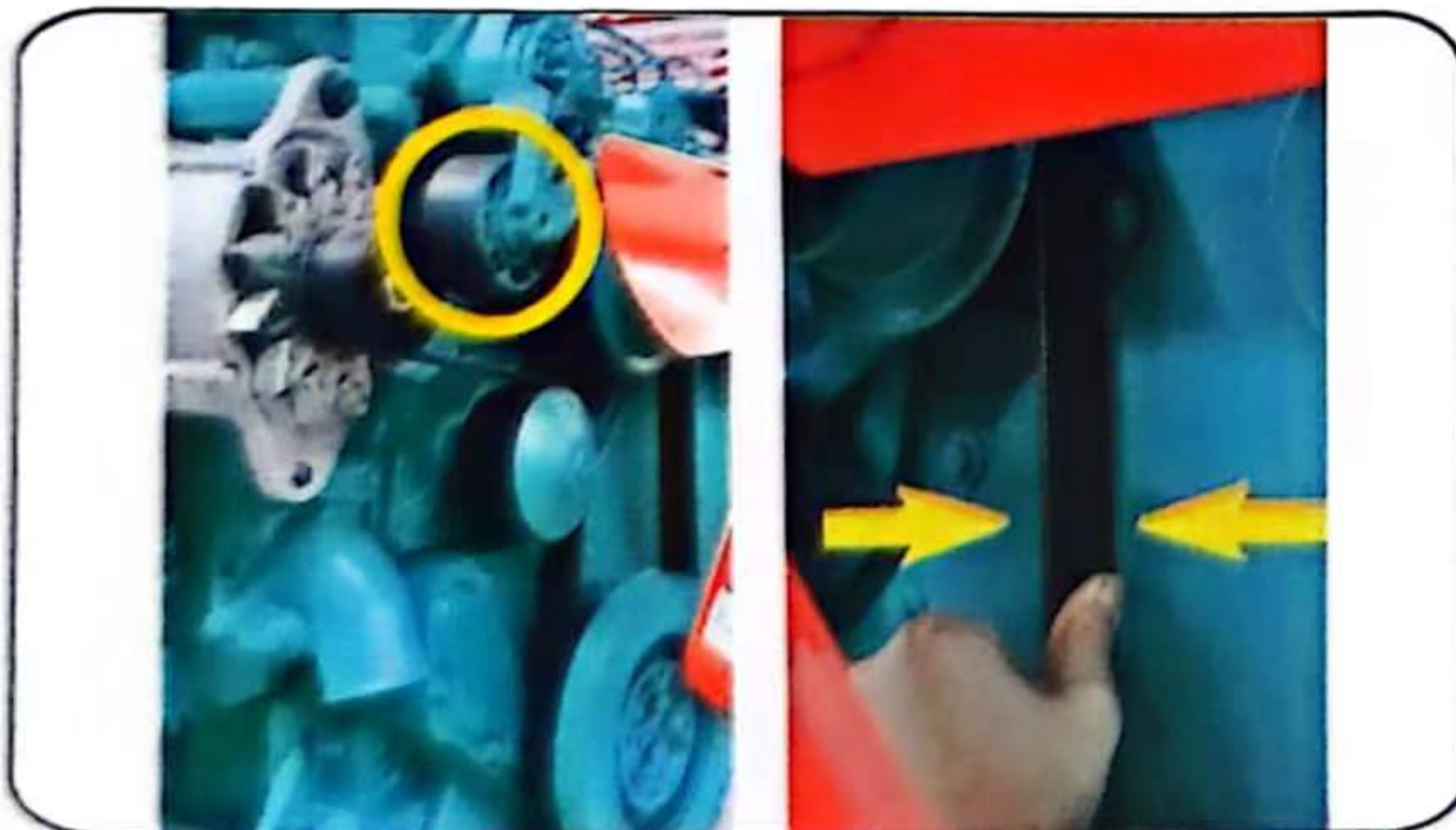
- Check and tighten cylinder head bolts



- Check and tighten fan hub and bearing bolts



- Check belt tension wheel and belt tension



- Replace thermostat (every 1200 hours or 12 months)



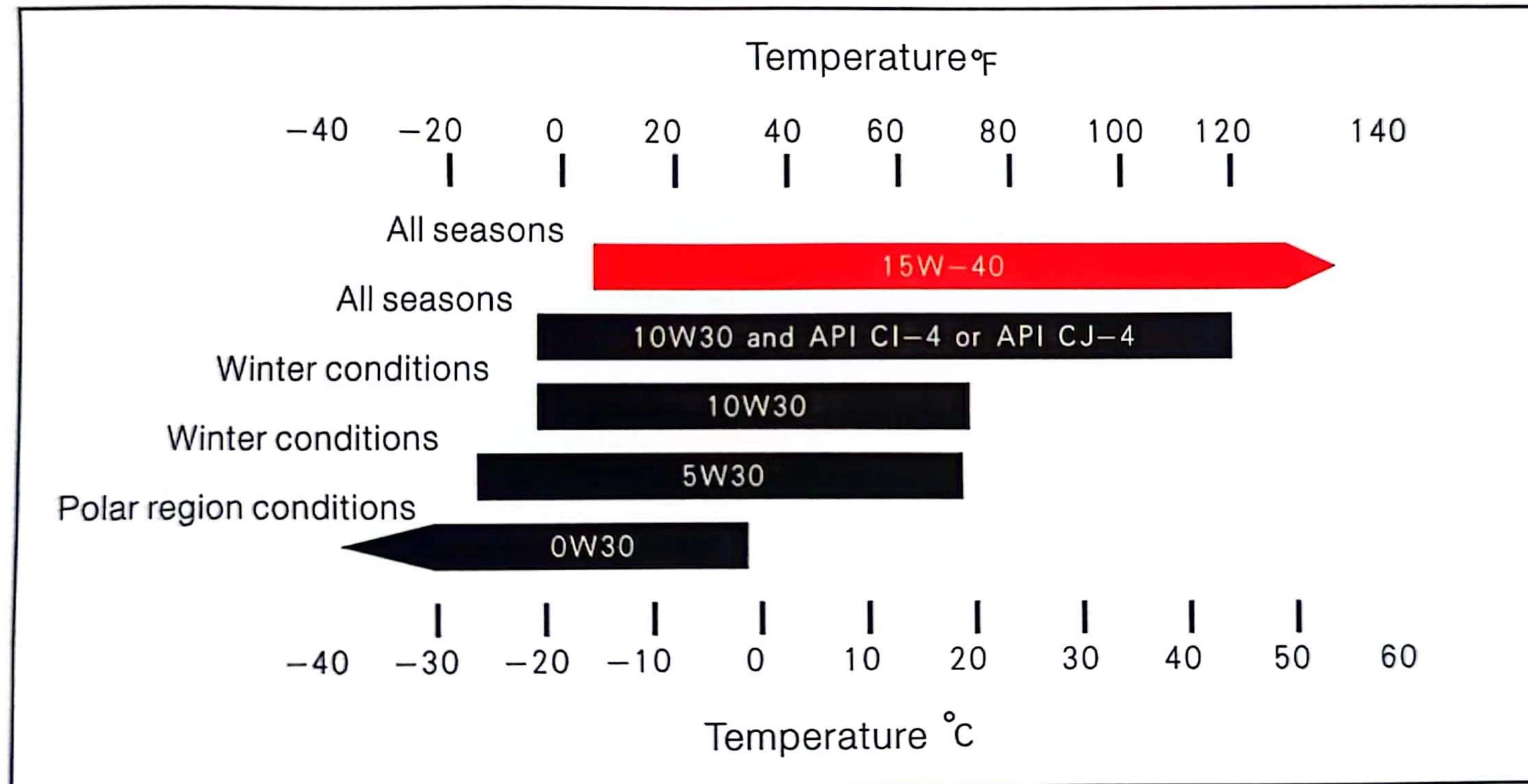
## Maintenance parts list

Engine Model	Fuel filter		Fuel Separator		Lube Oil filter		Air filter	Belt	
	Parts number	Fleetguard number	Parts number	Fleetguard number	Parts number	Fleetguard number	Parts number	Parts number	
4B/4BT/4BTA	C3931063	FF5052	C3930942	FS1280	C3908616	LF3345	Kw1524	C3288790	
4BTA3.9-G11							AF1811		
6BT					AF1811				
6BTA/6BTAA					C3937743	LF3349	KW2140		
6BTAA5.9-G12									
6CTA					C3401544	LF9009	AF1811		C3288475
6CTAA							K28900		
6L							KW2448		
6ZTAA	C4960198	FF5687	C4327369	FS36259	C4331005	LF9080	AA2960	C2873974	
QSB3.9	C5301448	FF5767	C5290009	FS90231ZZ	C3908616	LF3345	AF1811	C2873974	
QSB5.9					C3937743	LF3349	KW2140		
QSB6.7					C4989106	FF5612	C4897898		LF16015
QSZ13	C4960198	FF5687	C4327370	FS36260	C4331005	LF9080	AA2960	C2873974	
QSL8.9	C5445056	FF5866	C5405295	FS20123	C3401544	LF9009	AA90139	C3288475	

We reserve the right to change our products at any time due to product upgrade without prior notice.

## Lubricating oil

It is recommended to be Cummins original diesel engine oil above CH-4 level using for Cummins engine and above diesel engine oil (Cummins original engine oil above CI-4 level using for electronic control engine)



## Fuel oil for engine (National Standard GB252-94)

	10号	0号	-10号	-20号	-35号
All seasons cetane number no less than	50	50	50	45	43
condensation point no higher than	10	0	-10	-20	-35

Recommend to use cetane number  $\geq$  No.45 light diesel oil, and must precipitate for 72 hours