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Notice: Clarke Service Bulletin – CSB 011

Service Bulletin **Cooling System Maintenance**

Proper cooling system maintenance is essential to insure the reliability of diesel fire pump engines. This service bulletin addresses the specific cooling system maintenance requirements and informs on the causes and cures for certain cooling system component failures.

Coolant

The coolant specification for all Clarke fire pump drivers is a 50/50 ethylene or propylene glycol/water mix that meets ASTM D6210. Refer to the Operation and Maintenance Instructions Manual for the coolant and water quality specifications and the filling procedures. This specification contains the additional coolant additives necessary for the preservation and performance of the cooling system components. The correct coolant provides the following:

- Heat transfer
- Corrosion resistance
- Resistance to cavitation
- Resistance to scale and sludge build-up
- Freeze and boil over protection

Heat exchanger or radiator fill cap

The cooling system is designed to operate under pressure at all times. This is accomplished by the coolant fill cap that will retain 7 to 15 psi (depending on the engine model) in the cooling system when the engine is running. If it becomes necessary to replace the pressure cap, always replace the cap with the original equipment.

Water pump and thermostat

The engine water pump can either be internally direct driven by the engine gear train or externally by drive belt(s). If the pump is belt driven be aware of the belt and pulley condition and the correct belt tension. The tension and adjustment procedures are located in the engine Operation and Maintenance Instructions Manual for that particular engine. The thermostat is designed to maintain coolant temperature within an operating range (varies dependant on the engine model). Only original equipment should be used as a replacement.

Problem: Cavitation

Cavitation is a condition that occurs when bubbles form in the coolant flow in the low pressure areas of the cooling system and implode as they pass to the higher pressure areas of the system. This can result in damage to cooling system components, particularly the water pump impeller and cylinder liners. Cavitation in an engine can be caused by:

- Improper coolant
- Restricted coolant flow caused by collapsed hose or plugged system
- Coolant fill cap is loose or unable to retain the required pressure
- Insufficient fluid level
- Failure to de-aerate
- Overheat

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Maintenance Schedule

Weekly checks

- Coolant level and condition
- Condition of hoses and belts
- Coolant leaks
- Cooling loop valves position
- Cooling loop solenoid (if equipped)
- Cooling water discharge
- Clean Y-strainer
- Clean radiator core debris (if equipped)

Every 6 months checks

- Coolant protection level
- Belt tension

Every 2 years

- Change coolant
- Change coolant hoses and thermostat(s)
- Remove water pump to inspect impeller and seal

*****Important Service Notice*****

Anytime an engine experiences a high coolant temperature alarm condition the primary cause of the overheat must be determined and the cause corrected to prevent a recurring overheat event.

Additionally, if an event of a restricted flow, collapsed hose, insufficient coolant level or failed pressure cap is experienced, further investigation of the cooling system is required.

- 1) The coolant should be drained (after de-energizing the coolant heater).
- 2) Replace the engine thermostat(s).
- 3) Remove the engine water pump and inspect the impeller and seal for damage, replace as necessary, reassemble and refill coolant according to the Installation and Operations Instructions Manual
- 4) Run engine to verify normal operating temperature.

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