ESR 0573

OVERHAUL OF COOLING WATER SYSTEM

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Document control

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Summary of changes from previous version

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1 **Scope**

This standard sets out the minimum requirements, procedures and tests for the overhaul of the cooling water system and equipment in 48 class locomotives.

2 **General**

This standard shall be used in conjunction with Alco Maintenance Instruction MI-14000 and with the following ESR Instructions:

- ESR 0252 Procedure of the cleaning of oil contaminated water coolant systems of diesel locomotives.
- ESR 0256 Cooling water test procedures.
- ESR 0256 48 class locomotives - load box procedure.
- ESR 0270 Temperature switches fitted to diesel electric Locomotives.
- ESR 0552 48 class locomotives - 320F turbocharger overhaul.
- ESR 0570 Overhaul of radiators.
- ESR 0571 48 class locomotives - radiator fan drive overhaul.
- ESR 0572 Alco diesel electric locomotive - water pump overhaul.
- ESR 0574 48 class locomotives - aftercooler overhaul.

Overhauled cooling water systems and equipment shall be required to operate reliably for a minimum period of six (6) years.

All documentation regarding the overhaul of the 48 class locomotive cooling water systems, shall be completed with one copy retained by the Repairer and one copy sent to the Purchaser.

3 **Removal**

Prior to removal from the locomotive, a visual inspection shall be made to indicate the source of any water leaks or the presence of oil in the water.

Drain the cooling system, using all drainage points, to ensure the maximum quantity of liquid is removed. The liquid may be returned to a bulk storage tank for re-use. If a suitable tank is not available the liquid shall be disposed of strictly in accordance with the requirements of the Department of Environment & Climate Change & Water (DECCW). Any further advice may be obtained from the Purchaser.

The cooling water pipework and flexible hoses shall be drained and removed.

Couplings shall be match marked to ensure correct re-assembly.

Major and minor components including the aftercooler, radiator, fan and fan drive, engine temperature switches and the water pump shall be removed for service, overhaul or replacement.

Radiators shall be lifted using appropriate lifting gear which will prevent damage to the cores.
4 Disassembly, cleaning and inspection

Major and minor components of the cooling water system shall be cleaned, overhauled and inspected before re-assembly.

Parts and pipework shall be cleaned by immersion or washing in approved cleaning materials only.

Steel components shall be cleaned in a caustic cleaner.

Non-ferrous components shall be cleaned in a "cleaning material suitable for sensitive metals".

The water pump shall be overhauled to ESR 0572.

The radiator shall be overhauled to ESR 0570.

The fan and fan drive shall be overhauled to ESR 0571.

The aftercooler shall be overhauled to ESR 0574.

Engine temperature switches shall be serviced and reset to ESR 0270.

5 Replacement parts

It is mandatory to replace the following items:

- all pipe seals and gaskets.
- all flexible hoses.
- any pipework or coupling that is not suitable for a further six (6) years service.
- those items listed for mandatory replacement in the relevant component overhaul standard.

All new parts shall be serviced from the OEM or from alternative suppliers approved by the Purchaser.

Other items shall be re-used if their condition, after requalification, is satisfactory for a further six (6) years of specified locomotive service.

All new and re-used parts shall be stored in an area free from the effects of climate and dust.

6 Installation

Cooling system pipework shall be re-installed onto the engine after requalification. Match marks shall be aligned, gaskets, seals and flexible hoses renewed and bolts properly tightened.

Radiators shall be installed using purpose - built lifting apparatus and aligning equipment. The cores shall be properly supported so as not to induce stresses into the cores after installation.

Radiator fan and fan drive shall be re-installed into the locomotive.

Engine temperature switches shall be installed in the manifold as part of the cooling system pipework and electrically connected prior to commissioning.
Cooling system pipework and orifice plates shall be correctly installed and connected throughout the locomotive (refer to MI-14000).

7 Commissioning

After filling the cooling system from the bulk storage tank or from the water mains, ensure that the concentration of ALFLOC 2000 or ALFLOC 9518, a liquid cooling water treatment chemical is 4% (v/v), equivalent to 2000 mg/l sodium nitrate (ATC Total Dissolved Solids meter reading of 57). Refer to ESR 0253 for information regarding cooling water test procedures and treatment levels.

During locomotive load test visually inspect for water leaks or oil contamination and verify the correct operation and settings of the engine temperature switches.

After load testing is completed and the engine has cooled, again inspect for evidence of water leaks or oil contamination. Any defect shall be corrected and the system re-checked before release to service. For information regarding the cleaning of an oil contaminated water coolant system, refer to ESR 0253.

8 Reference standards

8.1 RailCorp standards

ESR 0252 Procedure of the cleaning of oil contaminated water coolant systems of diesel Locomotives.

ESR 0256 Cooling water test procedures.

ESR 0256 48 class locomotives - load box procedure.

ESR 0270 Temperature switches fitted to diesel electric locomotives.

ESR 0550 Overhaul of 48 class locomotive engine assembly

ESR 0552 48 class locomotives - 320F turbocharger overhaul.

ESR 0570 Overhaul of radiators.

ESR 0571 48 class locomotives - radiator fan drive overhaul.

ESR 0572 Alco diesel electric locomotive - water pump overhaul.

ESR 0574 48 class locomotives - aftercooler overhaul.

8.2 Alco standards

MI-14000 Alco Maintenance Instruction - 48 class locomotive - cooling water system.