

ALL RADIATOR TYPES



ALL VEHICLE APPLICATION WITH WATER-COOLED ENGINES

PROBLEM VARIOUS RADIATOR FAILURES

COOLANT LEAKS / COOLANT FLOW RESTRICTIONS > IMPROPER COOLING OF THE ENGINE > ENGINE OVERHEATING/SEVERE FAILURES

BACKGROUND

There are several common radiator failures and majority are provoked rather by external factors than by the radiator itself. In all instances, a faulty, leaking or restricted flow radiator will significantly affect the engine operation and may lead to its unrepairable failures.

Common radiator problems, symptoms and root causes:

CORROSION > LEAKS AND RESTRICTED COOLANT FLOW

SYMPTOMS

Aluminium powder and rust deposits at the radiator header plate / inside the radiator /at inlet and outlet

POSSIBLE ROOT CAUSE

- Improper use of coolant, i.e. tap water/dirty water, reuse of antifreeze, mixing of different kinds of antifreeze, improper coolant/coolant mixture
- Saline air in coast regions or road salt

DEBRIS/DEPOSITS BUILT UP INSIDE TUBES > LEAKS AND RESTRICTED COOLANT FLOW

Various contaminants built up inside the coolant channels: **scale, jelly-like substance, other debris/ particles concentration**

- Improper use of coolant, i.e. tap water/dirty water, reuse of antifreeze, mixing of different kinds of antifreeze, improper coolant/coolant mixture
- Improper / lack of flushing of the system prior to radiator replacement

SURFACE SOILING > INSUFFICIENT HEAT EXCHANGE

Radiator surface covered by various contaminants restricting air flow through the fins

Excessive pollution environment, lack of vehicle maintenance, oil/coolant leaks causing the surface being sticky thus attracting debris/contaminants

ELECTROLYSIS > LEAKS AND RESTRICTED COOLANT FLOW

Visible white powder inside / at header plates, greenish fins and tubes

Vehicle's fault current affecting the cooling system causing an electrochemical reaction

SYSTEM OVERPRESSURE > BLOWN/BURST TANKS / RADIATOR TUBES > COOLANT LEAKS

Visible bursts or deformation on the radiator parts

Defective radiator cap, restricted flow within expansion tank, blown engine's header gasket, improper coolant (too low boiling point)

BROKEN RADIATOR THREADS > COOLANT LEAKS

Leaks/loose couplings within oil cooler fittings (if integrated with the radiator), coolant sensor socket, drain plugs

Threads stripped due to careless/improper service

MECHANICAL DAMAGES > BROKEN/BENT TUBES, CRACKED TANKS > LEAKS / RESTRICTED COOLANT FLOW

Visible surface/elements injuries and leaks

Careless handling/transportation, vehicle collision

RECOMMENDED SOLUTION

Inspect the radiator surface, cap, expansion tank and ducts on a regular basis. Use solely coolant/coolant mixture prescribed by the car manufacturer

Before installing a new radiator inspect what caused the previous part to fail and eliminate its root cause.

Specifically:

- The entire cooling system must be flushed
- Inspect the vehicle electrical system, make sure the cooling system is not exposed to/in contact with a fault current
- Inspect the radiator cap, expansion tank and ducts as well as make sure the engine header gasket is intact
- Inspect the oil cooler connection (if applicable) and make sure the oil circuit is not overpressurized

Handle the radiator with proper care. It is fragile and its sticking out elements such as mounting brackets, inlet/outlet or drain plugs can easily get broken in transport or by installation.

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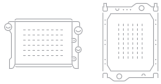
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PICTURES



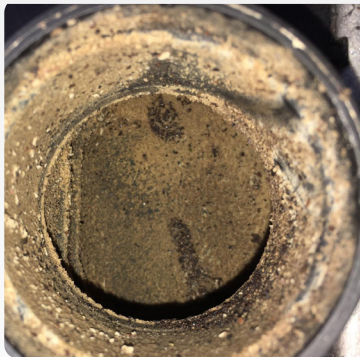
Aluminum corrosion > leaks. Caused by improper coolant reacting chemically.



Scale built up / corrosion > flow restrictions, leaks. Improper coolant, chemical reaction with aluminum.



Excessive scale built up > flow restriction, overpressure. Scale precipitating from tap water used as coolant.



Inner soiling / scale / corrosion seen at the radiator outlet. Improper coolant applied.



Poor quality repairs / broken plastic tank elements. Leaks.



Careless service / transportation. Broken drain plug.



Excessively soiled radiator surface. Disable its heat dissipating function thus leads to engine overheating.



Blown radiator / radiator tank. Caused by system overpressure and e.g. engine header gasket blown, faulty radiator cap/expansion reservoir or restriction within the cooling system/radiator inner channels.



Inner flow restrictions. Impurities in the cooling system not flushed properly.



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