
Fleet Radiator Core Cleaning and Fin Straightening SOP

1.0 Maintenance Objective & Frequency

The objective of this procedure is to remove debris, dirt, and bent fins from the radiator core to restore optimal heat transfer and airflow. This PM prevents engine overheating, reduces fan clutch cycling, and extends radiator service life. Perform this procedure annually or at 1000 operating hours, whichever comes first, or more frequently if operating in high-debris environments.

2.0 Lockout/Tagout (LOTO) & Safety

- **Engine Shutdown:** Ensure the engine is off and cool to the touch (below 40°C) to prevent burns and pressure release.
- **Electrical Isolation:** Disconnect the battery negative terminal to prevent accidental fan engagement or electric cooling fan startup.
- **Thermal Hazard:** Allow the radiator and coolant system to cool completely. Coolant temperature must be below 40°C before opening any caps or drains.
- **PPE Requirements:** Wear safety glasses, cut-resistant gloves, and a dust mask. Use hearing protection if using compressed air.
- **Chemical Safety:** If using a degreaser or radiator cleaner, follow the manufacturer's SDS for proper handling and ventilation.

3.0 Required Tools, Parts & Lubricants

- Radiator fin comb set (various tooth pitches, typically 8-16 fins per inch)
- Low-pressure compressed air gun with nozzle (max 50 psi)
- Garden hose with spray nozzle or pressure washer (max 1500 psi, wide fan tip)
- Non-abrasive brush (nylon bristle, 1-2 inch width)
- Radiator cleaning solution (alkaline or neutral pH, compatible with aluminum/copper cores)
- Bucket or catch pan for coolant
- Shop towels or lint-free rags
- Flashlight or inspection light
- Torque wrench (for reinstallation of radiator mounting bolts, if removed)

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Confirm engine is off, cool, and battery disconnected.
2. Drain the coolant into a clean catch pan if the radiator will be removed. If cleaning in place, ensure the coolant level is below the core area to avoid contamination.
3. Remove any debris guards, bug screens, or fan shrouds that obstruct access to the radiator core. Set hardware aside in a labeled container.

4. Using the flashlight, inspect the entire core face for large debris (leaves, bugs, mud). Remove large debris by hand or with a soft brush. Do not use metal tools that could damage fins.
5. Apply radiator cleaning solution to the core following the manufacturer's dilution instructions. Allow dwell time as specified (typically 5-10 minutes) to break down oil and grime.
6. Rinse the core from the engine side outward using a garden hose or pressure washer at low pressure (max 1500 psi, wide fan pattern). Keep the nozzle at least 12 inches from the fins to avoid bending them. Rinse until water runs clear.
7. Use low-pressure compressed air (max 50 psi) to blow out any remaining water and debris from the core. Work from the engine side outward. Hold the nozzle at a 45-degree angle to the fins to avoid flattening them.
8. Select the appropriate fin comb for the fin density (count fins per inch). Starting at one edge, gently comb the fins in the direction of airflow (typically vertical). Work in small sections, straightening bent fins without tearing the metal. Do not force the comb if it snags; back off and realign.
9. Inspect the core with the flashlight after combing. Look for any remaining bent fins, cracks, or leaks. Re-comb any stubborn areas. If a fin is torn or missing, note it for potential repair or replacement.
10. Reinstall all removed debris guards, bug screens, and fan shrouds. Torque mounting bolts to OEM specifications (typically 10-15 Nm for plastic shrouds, 20-30 Nm for metal brackets).
11. Refill coolant to the proper level using the correct coolant type for the vehicle. Bleed air from the system per OEM procedure.
12. Reconnect the battery negative terminal and tighten to 10 Nm.

5.0 Verification & Return to Service

1. Start the engine and allow it to reach operating temperature. Verify no coolant leaks at the radiator, hoses, or drain plug.
2. Monitor the coolant temperature gauge. It should stabilize within the normal operating range (typically 85-95°C for heavy-duty diesels) without excessive fan cycling.
3. Perform a visual inspection of the core with the engine running. Ensure no debris is being drawn into the core and that airflow is unobstructed.
4. If the vehicle has a transmission cooler integrated into the radiator, check transmission fluid level and temperature after a short test drive.
5. Sign off on the PM work order in ServiceGrid, noting any anomalies (e.g., torn fins, minor leaks) and the date of next scheduled cleaning.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.