ELECTRO-MOTIVE DIVISION • GENERAL MOTORS CORPORATION
SERVICE DEPARTMENT

MAINTENANCE INSTRUCTION

CLEANING AND REPAIR OF WATER AND OIL COOLING RADIATORS

This Maintenance Instruction describes the procedures for cleaning and repairing the oil and water cooling radiators.

1. Cleaning

   The excess dirt should be removed from the fins and outside area of the core. The header and gasket surfaces should be cleaned with a wire brush. The core should be immersed in a hot (180° to 200° F.) alkaline cleaning solution capable of removing both oil and water deposits. The solution must be air agitated, or one header plate should be applied and the solution forced through the core. All external and internal surfaces must be clean. When the radiators are clean, they should be immersed in a tank of clean hot water or flushed with a hot water hose to remove the remaining residue and cleaning solution.

2. Inspection

   The frame should be checked for bent header flanges and loose support bases. The flanges must be straightened and the loose support bases repaired before the core is tested for leaks.

3. Loose Support Base Repair

   The loose support bases should be repaired by soldering them to the header flange and header support with EMS 851 (50-50) solder using EMS 895 flux*. The header surfaces must be parallel within 1/32"

4. Testing

   The radiator should be tested by applying 5 to 10 psi of air pressure to the outside of the radiator tubes while the radiator is submerged in a water tank. If any leaks are present they will show up as air bubbles at the end of the leaking tube or between the tubes if it is a tube to header leak. The air pressure must not exceed 10 psi as the higher pressure will cause the tubes to collapse and break the bond between the fin and tube. The location of the leaks should be marked and the radiator removed from the water tank.

5. Repair

   The air pressure must be released and the repair area completely dry before any repairs are made. For tube to header leaks the repair can be made by flowing soft solder EMS 851 (50-50) over the leak point using EMS 895 flux*.

   Tube leaks are repaired by folding over both ends of the leaking tube flat against the header and flowing soft solder EMS 851 using EMS 895 flux* over both ends of the tube.

   No more than four adjacent tubes may be repaired, nor may the total number of tubes repaired exceed 5% of the total number of tubes in the core.

   Repeat test procedure as outlined in Step 4.

*NOTE: Repaired areas should be thoroughly flushed after soldering to remove remaining flux.

6. Final

   All distorted fins must be straightened and properly spaced. If the bond between the side of the outside row of tubes and fins has been broken, it should be repaired with a soft torch. Loose fins allow the flat side of the tubes to "oil can" with fluctuations in the water pressure and result in fatigue cracks in the narrow edge of the tube.

   The final test should be made with 60 psi of air pressure applied to the inside of the tubes with radiators submerged for approximately 30 minutes in a water tank. Production type headers can be used for this test.

   All external surfaces of the radiator should be given one spray coat of black radiator paint (one part 8204764 mixed with one part of U.M.P. Naptha). The gasket and water swept surfaces must not be painted.

EQUIPMENT LIST

Solder EMS 851 (50-50) - 1-1/2 lb. bar 8225762
Flux EMS 895 - 1 gal. . . . . No. 500-FL-93