

DIRECTORATE GENERAL BORDER ROADS

GENERAL MAINTENANCE INSTRUCTION NO 51

ON

EFFECTS OF DESERT ON THE COOLING SYSTEM OF VEHICLES AND

EQUIPMENTS

1. **Aim** This instruction enumerates the effects of desert on various assemblies / components of the cooling system of vehicles and equipment operating in desert areas. Suggested remedial measures and recommendations to overcome the same have also been explained.

2. **Characteristics of desert.** The effect of desert condition on the Cooling system of vehicles and equipment has been summarized under the following principal characteristics of desert :-
 - (a) Sand, dust and storms.
 - (b) Excessive heat
 - (c) Salt and Salinity Water.
 - (d) Dry weather (Lack of humidity and moisture).

3. **Details of the effects of desert on cooling system.** These have been tabulated in Appendix 'A' to this **GENERAL MAINTENANCE INSTRUCTION** for necessary action.

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EFFECTS OF DESERT ON THE LUBRICATION STSTEM OF VEHICLES AND EQUIPMENT

| Affected Assy/Component | Sand, Dust & Storms | Excessive heat | Salt/Salinity in water | Dry Weather (Lack of humidity & moisture) | Remedy/ Recommendations |
|--------------------------------|--|---|---|--|--|
| Radiator | Causes scales formation, which has insulating effect on cooling of water inside radiator. Hence overheating of engine takes place. | (a) Does not allow cooling of radiator water causing overheating of engine. (b) Causes rapid evaporation of water. | Salty & Brackish water also forms scales inside radiator cores which :- (a) reduces cooling effect on radiator water, (b) even results into choking of radiator cores. (c) Makes soldering (of damaged radiators) difficult. | Increases evaporation of radiator water. | (a) Flush radiator with hot soda as solution minimum once every 6 months to remove scales. (b) Use clean water after filtering, and preferably use drinking water. (c) Top up radiator daily with clean water. Carry water along on long drives for topping up radiator. |
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| Radiator | - | Its rubber washer gets perished frequently, whereby steam escapes and radiator water spills thus reducing water level in radiator and causing over heating. | Causes corrosion and needs their frequent replacement | - | (a) Check washer for serviceability and replace, if perished/deficient. *(b) Use pressurised caps to increase boiling pt of water and thus reduce water evaporation. *© Water being scarce in desert, provide 'extra water tank' made of galvanized tin sheet and fit it in front of radiator assy for topping up / replacing radiator water particularly on long moves away from base. For better cooling 'Expansion tank' to be fitted with a circulating pump. |
| Radiator hoses | - | Set perished soon | - | - | Provide one set of radiator hose to drivers as part of their vehicle's Kit list (along -with extra clips and nuts) for replacement whenever required. |
| Water pump Assy Impeller pump, brg, seal & shaft | (a) Rubber seal becomes soft and needs replacement frequently. (b) Impeller bearing wears out faster due to abrasive action. | Impeller bearing and seal/shaft fails as its grease melts and hence need replacement often. | (a) Water pump shaft gets corroded early. (b) Its seal gets rusty and soon fails due to corrosion. | - | *Provision Water Pump Repair Kit minimum at double existing scale for Field Workshops |

| Affected Assy/Component | Sand, Dust & Storms | Excessive heat | Salt/Salinity in water | Dry Weather (Lack of humidity & moisture) | Remedy/ Recommendations |
|-------------------------|---------------------|--|------------------------|---|---|
| Fan belt | - | (a) Gets softened and loses its tension, thereby slips on fan pulley and causing poor cooling of radiator water and thereby early overheating of engine. (b) Gets perished soon and needs frequent replacement. | - | - | *(a) Needs frequent adjustment fan belts. (b) Provide extra fan belt set to every driver/operator as part of veh/eqpt kit. |

Legend :- Items *marked will be attended to by the maintaining Field Workshops.