

DESERT EFFECTS ON EQUIPMENT

The effects that the desert has on equipment may appear to be a strange topic for this type of publication. As discussed in Chapter I, it can also destroy equipment. Chapter I, the desert is harsh and can kill an unprepared soldier. Part of being prepared is having your equipment ready for the desert. The emphasis here is on needed knowledge and techniques, which if applied can save lives and equipment.

The majority of the material in this Chapter is extracted from FM 90-3, Desert Operations. Although FM 90-3 serves as a guide for operations in the deserts where U.S. Army Forces may one day fight, the principles taught can be applied to Fort Irwin and the Mojave Desert.

The desert environment requires a very high standard of maintenance performed well away from specialized support personnel. Operators must be fully trained in operating and maintaining their equipment. Dust, sand, and wind are probably the greatest danger to the efficient functioning of equipment in the desert. It is almost impossible to avoid particles settling on moving parts and acting as an abrasive. Before deploying to a desert area for an exercise, or when assigned to such an area, equipment operator training should be emphasized and should include:

- The most probable effects the desert will have on the equipment

- How to most efficiently operate the equipment in this environment

- Any special or different preventive maintenance required by the desert effects

- Basic desert recovery and repair techniques required

- How to safely operate the equipment in the desert

Vehicles. Vehicle cooling and lubrication systems are interdependent. Malfunction by one will rapidly place the other under severe strain. All types of engines are apt to overheat to some degree, leading to excessive wear and ultimately leaking oil seals in the power packs. Oil levels must be checked frequently to ensure the proper level is being

maintained; seals checked for leakage; and oil consumption watched to ensure that it is not higher than normal. Radiators and airflow areas around engines must be kept clean and free of debris and other obstructions, and water cooled engines should be fitted with condensers to avoid waste as steam through the overflow pipe. Cooling hoses must be kept tight (a drip a second is 7 gallons in 24 hours). Operators should not remove hood side panels from engine compartments while the engine is running, as this will cause turbulence, leading to ineffective cooling.

Lubrication. Lubrication must be the correct viscosity for the temperature and must be kept to the absolute minimum in the case of exposed or semi-exposed moving parts. Sand mixed with oil forms an abrasive paste. Lubrication fittings are critical items and must be checked frequently. If they are missing, sand will enter the housing and cause bearing failure. Teflon bearings require constant inspection to ensure the coating is not being removed. Maintenance of engines is critical due to the strong possibility of sand and dust entering the cylinders or their moving parts when the equipment is stripped. It is essential to have screens to protect against flying sand. All tools must be kept inspected daily, paying particular attention to hidden surfaces and other likely places where corrosion might occur and not be quickly noticed.

Filtration. It takes comparatively little dirt to block a fuel line. Air cleaners must be examined and cleaned on every type of equipment at frequent intervals. The exact interval depends on the operating conditions but should be at least daily. Filters should be used when receiving fuel and the gap between the nozzle and the fuel tank filler covered. Oil filters and engine oils will require changing more often than in temperate climates.

Batteries. Batteries do not hold their charge efficiently in intense heat. The specific gravity of the battery will have to be changed to adjust to this environment and to also compensate for cool nights. Batteries must be kept full, but not overfilled, and a reserve of distilled water should be carried. Air vents must be kept clean or vapors may build up pressure and cause the battery to explode. Voltage regulators should be set low as practical. Dry battery supplies must be increased to offset high attrition rate caused by heat exposure.

Electrical. Wind-blown sand and grit will damage electrical wire insulation over a period of time. Cables that are likely to be damaged must be protected with tape before the insulation becomes worn. Sand will also find its way into parts of items such as spaghetti cord plugs, either preventing electrical contact or making it impossible to join the plugs. A brush, such as an old toothbrush, can be used to brush out items before they are joined.

Pressure. Severe heat increases pressure in closed pressurized systems such as the M2 Fire Burner unit and increases volume of liquid. Care must be exercised to ensure that working pressure of all equipment is within safety limits and caution must be exercised when removing items such as filler caps.