

OPERATION IN SNOW

- 1) Keep fuel tank full at all times.
- 2) Keep snow and ice away from fuel filler opening to avoid condensation in fuel tank.
- 3) Clean snow and ice away from exterior controls and indicators.
- 4) Protect backhoe operator's compartment (SEE) or crane controls (HMMH) when parked if shelter is not available.

COLD WEATHER TIPS

- 1) Operate the drain valves on the front air tank, centerline tank, and the rear reservoir tank to remove condensation in air brake system.
- 2) Ensure the SEE's compressed air system antifreeze unit is set for the winter season. The antifreeze unit injects ethyl alcohol into the air brake system to keep water from freezing in the brake lines. Check the alcohol reservoir to make sure it is filled.
- 3) Keep the antifreeze unit setting in the number 1 (open) position for winter
- 4) Keep the alcohol reservoir filled so dirt and dust cannot get in.
- 5) The SEE may be hard to start when the temperature drops below 32 °F (0 °C). The cold weather starter system has a fuel canister that automatically injects ether into the engine when the cold start button is pushed.
- 6) If the SEE's engine runs roughly after pushing the button, chances are the fuel canister is empty. Replace the canister.
- 7) Check the hose from the washer fluid reservoir for cracks and splits. If damaged, snip off a half inch of the hose and reinstall hose. If washer fluid is still not flowing, check the pump or replace the rubber hose

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SMALL EMPLACEMENT EXCAVATOR (SEE) COLD WEATHER OPERATION

This abbreviated checklist is not to be used as a replacement for the -10 series Tech Manuals or any other PMCS guide

FM 9-207 Operation and Maintenance of Ordnance Materiel in Cold Weather contains detailed instructions for operation and maintenance of equipment in Cold Weather. **FM 31-70 BASIC COLD WEATHER MANUAL** contains detailed instructions for living and working in cold weather conditions. **TM 5-2420-224-10** contains detailed PMCS instructions for proper maintenance and operation.

NOTE: A very high standard of maintenance is essential to long term operation under conditions of extreme cold. Cold temperature can cause early failure of systems. Constant checking is necessary to prevent failures.

EXTREME COLD

- 1) If operating backhoe (SEE) or crane (HMMH) in extreme cold, make sure proper operator protection is worn. Extensive preparation of the vehicle is required for extremely cold weather.

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EXTREME COLD (continued)

- a) Extreme cold causes many problems:
- b) Lubricants thicken or congeal
- c) Batteries may freeze or lose electrical efficiency
- d) Fuel may not readily vaporize for combustion
- e) Various materials will become hard, brittle, and easily damaged

2) **Cooling System.** Inspect for leaks and general condition. Make sure clamps are tight and there is enough fluid in expansion tank. If system needs service, notify unit maintenance.

3) **Fuel Tank.** Do not allow fuel tank to remain partially empty for a long period in extremely cold weather. Fill to filler neck after each work period to help avoid water condensation in the fuel tank. Remove all ice and snow from around filler neck before refueling.

4) Electrical System.

- a) Inspect battery cables, wiring harnesses, and wiring. Notify unit maintenance if damaged.
- b) Use lights and other electrical equipment as little as possible when system is not charging.

5) **Lubrication.** Lubricate in accordance with the TM/LO.

Engine Operation.

1) Before starting, make sure fuel and oil in engine are thin enough to flow. If oil drips from dipstick, it is thin enough for engine to be started. Failure to observe this caution could result in damage to equipment.

Engine Operation (continued)

- 2) Use ether start aid.
- 3) Low idling speed during extremely cold temperatures can result in incomplete combustion and formation of heavy deposits on valves.
- 4) Run engine at reduced speed only long enough to circulate oil through engine, then increase speed and warm up engine.
- 5) Cover front of radiator, if necessary, to bring engine up to operating temperature. Remove cover after warm-up to avoid overheating engine.

Vehicle Operation.

- 1) Test brakes and equipment controls carefully.
- 2) Move all controls slowly to warm hydraulic oil. Cycle each control several times. Normal warm-up period is 3-10 minutes.
- 3) Operate under light load for first 5 minutes of operation.
- 4) Make sure compressed air antifreeze system is on.

Parking and Non-Use.

- 1) Park vehicle in sheltered place, if possible. Cover to protect engine, accessories, and controls from ice and snow.
- 2) Park vehicle in sheltered place, if possible. Cover to protect engine, accessories, and controls from ice and snow.
- 3) Run vehicle onto planks to prevent tires from freezing to ground. Block up bucket on SEE.
- 4) Clean wet snow or mud from tires and hydraulic cylinders before it freezes.
- 5) In extremely cold weather, notify unit maintenance to remove batteries and store in moderately warm area. Have batteries installed just prior to starting engine.