

2. Operation.

Low idling speeds during extremely cold temperatures can result in incomplete combustion and heavy deposit formations on valves. These deposits can cause burned valves, bent pushrods or other damage to valve components.

a. Carefully follow engine start and warm-up procedures above. Allow engine time to thoroughly warm up so that it idles smoothly. However, do NOT allow to idle excessively or at speeds that are too low. Run engine at reduced speed ONLY long enough to circulate oil through engine, then increase speed.

b. To avoid water condensation in fuel tank, completely fill fuel tank after each operating period. Also drain water from fuel tank.

c. Remove snow, ice and mud from engine compartment, hydraulic cylinders, track components, and implements before operation.

d. Ensure tractor and all implements are clean before parking machine. Park in a sheltered area out of the wind. Place tracks and implements on planking, to keep them from freezing to the ground.

e. If shelter is not available, park tractor so it does not face into the wind. Cover machine if possible, to protect engine, accessories and controls from ice and snow.

CAUTION

Do NOT attempt to break tracks loose under engine power. Do NOT move tractor with large frozen lumps of material in tracks. Failure to follow this caution may cause damage to equipment.

GTA# 43-01-093

D7F TRACTOR

COLD WEATHER OPERATIONS

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

References: FM 9-207, Operations and Maintenance of Ordinances Materiel in Cold Weather; FM 31-70, Basic Cold Weather Manual; FM 31-71, Northern Operations; TM 5-2410-233-10 (detailed PMCS instructions)

NOTE

- o Follow this procedure to start engine at any temperature.**
- o Tractors with ether starting aid system, use ether to start engines at temperatures below 32°F (0°C).**
- o If your tractor is equipped with glow plugs, use glow plugs to preheat precombustion chambers at temperatures from 60°F (16°C) to 0°F (-18°C).**

Perform these steps if machine is equipped with a D333 or early model 3306 engine that has glow plugs.

1. If temperature is below 60°F (16°C), push in and turn heat start switch to HEAT, for time specified below:

- a. From 32-60°F (0-16°C), place heat start switch to HEAT for one (1) minute.

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Distributor: U.S Training Support Center

June 2006

Perform these steps if machine is equipped with a D333 or early model 3306 engine that has glow plugs. (continued)

- b. From 0-32°F (-18-16°C), place heat start switch to HEAT for two (2) minutes.
 - c. Below 0°F (-18°C), place heat start switch to HEAT for three (3) minutes.

2. Release heat start switch when preheat time has elapsed.

Perform these steps if machine is equipped with a later model 3306 engine with an ether starting aid system.

1. If temperature is 32°F (0°C) or below, push in and turn heat start switch to START (HEAT START on data plate). Hold switch in START position while at the same time injecting ether with ether starting aid switch. Push ether starting aid switch for 2-3 seconds, then release.

CAUTION

o DO NOT operate starter motor for more than 30 seconds at a time. After 30 seconds, allow starter motor to cool for at least two minutes before attempting to start engine again. Excessive heating of starter motor may result in damage or early starter failure.
o Engine MUST have adequate oil pressure within 15 seconds after starting. DO NOT leave engine on if oil pressure is not indicated on gage after 15 seconds. Damage to engine will result.

2. Crank engine as follows:

- a. Push in and turn heat start switch to START and crank engine:
- b. Press manual override switch to by-pass automatic disconnect system, if temperature is below 32° F (0°C).

NOTE

If temperature is below 60°F (16°C) and your engine is equipped with glow plugs, return heat start switch to HEAT until engine runs smoothly. As soon as engine is running smoothly, release heat start switch.

- c. Release heat start switch and manual override switch as soon as engine starts.
- d. Run engine at low idle after initial start to allow lubrication to reach turbocharger.

3. If engine fails to start, perform the following:

- a. If engine is equipped with glow plugs and does not start, return heat start switch to HEAT for 30 seconds, then attempt to start engine again.
 - b. If engine is equipped with ether starting aid system and does not start, push ether starting aid switch for 2-3 seconds, then release for 2-3 seconds, at the same time engine is cranked. Continue to use ether at 2-3 second intervals during cranking, until engine starts and is running smoothly.
4. If engine still does not start, continue to crank engine at the following intervals:
- a. Wait for two (2) minutes.

- b. Repeat 30-second starting cycles, with 2-minute waits in between cycles, for a total of six (6) more times.
 - c. If engine still fails to start, wait for 30 minutes.
 - d. Repeat 30-second starting cycles, with 2-minute waits, four (4) more times.
 - e. If needed, wait another 30 minutes, then repeat four (4) additional 30-second starting cycles.

CAUTION

Limit idling time. Excessive idling can cause carbon buildup and damage to engine.

5. Before applying load, warm up engine for at least five (5) minutes with governor control lever at 1/4- to 1/2-speed position.
6. Check gages and instruments to ensure they register in normal operating range.

EXTREME COLD OPERATION

1. Introduction. Extreme cold causes many problems:
 - a. Lubricants thicken or congeal.
 - b. Batteries may freeze or lose their electrical efficiency.
 - c. Fuel may not readily atomize for combustion.
 - d. Various materials become hard, brittle, and easily damaged.
 - e. Cooling system requires adequate protection from extreme cold.
 - f. Fuels, lubricants, and antifreeze require special storage, handling, and use.