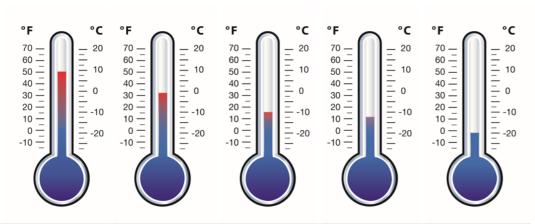


Natural Gas Engine Operation in Cold Climates

What's affected?



	<50°F (<10°C)	<32°F (<0°C)	<15°F (<-9°C)	<11°F (<-12°C)	<-2°F (<-19°C)
Coolant	•	•	•	•	•
Fuel	Depends on Fuel Quality				
Air		•	•	•	•
Batteries				•	•
Oil				•	•

General Tips

- When prolonged idling is required for cab climate control, idle the engine at an RPM adequate to heat coolant above 140°F (60°C).
- Insulate exposed lines, filters, pumps, and reservoirs.
- Check electrical systems daily and cold weather support systems weekly.
- Make sure CNG fuelling stations are equipped with a dryer to remove any moisture before the gas is compressed.
- For more detailed information, reference Service Bulletin # 4332709 on QuickServe Online, the operation and maintenance manual, or contact your local Cummins distributor.

Specific Tips and Accessories

Fluid/Component	Information and Tips	Recommended Accessories
Coolant	In cold climates, coolant helps warm the engine and components, it is the first line of defense. • It is beneficial to use a coolant heater in temperatures below 50°F (10°C). It is recommended to use a coolant heater below -10°F (-23°C).	Engine: • Coolant heater - Immersion - External
Fuel (CNG/LNG)	The effect of cold temperature on natural gas will vary by fuel quality. • Drain fuel filters daily - this will prevent oil and/or heavy hydrocarbons from collecting in the filter	Engine: • Fuel warmer
Air	 Lower air temperatures forms condensation in the charge air cooler. Under 32°F (0°C), use winter front to keep intake temperatures above freezing Under 15°F (-9°C), pull air from within the engine enclosure If consistently operating in conditions under -2°F (-19°C), make sure your truck can pull intake air from a compartment around the exhaust stack to sufficiently preheat the air 	Chassis: • Winter front • Intake air heater • Thermatic controlled fan
Batteries	Manufacturers generally recommend battery and system capacity to provide adequate start at 0°F (-18°C). As temperatures drop, the battery's cranking capacity may decrease. Compounding the issue, the system load increases at lower temperatures. • Make sure your batteries have good cranking capacity and hold charge before trips	Chassis: • Battery warmer • Battery sleeve • Arctic battery
Oil	As the temperature drops, the viscosity of oil increases leading to higher friction • Certain oil weights are recommended for different temperature ranges • Oil can also be heated to lower the viscosity using oil heaters • It is important to check your oil level more frequently at colder temperatures	Engine: • Oil heater • Oil pan cover