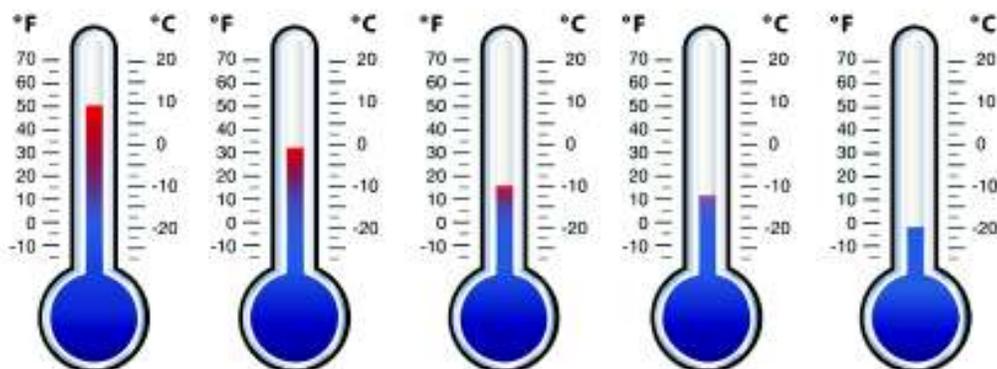


Natural Gas Engine Operation in Cold Climates

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
<p>Coolant</p>	<p>In cold climates, coolant helps warm the engine and components, it is the first line of defense.</p> <ul style="list-style-type: none"> • <i>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).</i> 	<p>Engine:</p> <ul style="list-style-type: none"> • Coolant heater <ul style="list-style-type: none"> – Immersion – External
<p>Fuel (CNG/LNG)</p>	<p>The effect of cold temperature on natural gas will vary by fuel quality.</p> <ul style="list-style-type: none"> • <i>Drain fuel filters daily - this will prevent oil and/or heavy hydrocarbons from collecting in the filter</i> 	<p>Engine:</p> <ul style="list-style-type: none"> • Fuel warmer
<p>Air</p>	<p>Lower air temperatures forms condensation in the charge air cooler.</p> <ul style="list-style-type: none"> • <i>Under 32°F (0°C), use winter front to keep intake temperatures above freezing</i> • <i>Under 15°F (-9°C), pull air from within the engine enclosure</i> • <i>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</i> 	<p>Chassis:</p> <ul style="list-style-type: none"> • Winter front • Intake air heater • Thematic controlled fan
<p>Batteries</p>	<p>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.</p> <ul style="list-style-type: none"> • <i>Make sure your batteries have good cranking capacity and hold charge before trips</i> 	<p>Chassis:</p> <ul style="list-style-type: none"> • Battery warmer • Battery sleeve • Arctic battery
<p>Oil</p>	<p>As the temperature drops, the viscosity of oil increases leading to higher friction</p> <ul style="list-style-type: none"> • <i>Certain oil weights are recommended for different temperature ranges</i> • <i>Oil can also be heated to lower the viscosity using oil heaters</i> • <i>It is important to check your oil level more frequently at colder temperatures</i> 	<p>Engine:</p> <ul style="list-style-type: none"> • Oil heater • Oil pan cover

Note: This document is not intended to replace the information found in the Operation and Maintenance Manual or Service Bulletins.