

## October Edition of Natural Gas Engine Tech Talk

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### Topic of the Month: Cold Weather Operation

Well, I saw frost on the ground here in Indiana this morning, so it seems an appropriate time to talk cold weather operation of Cummins Natural Gas Engines. Typically, customers have noted that their NG engines start even when their diesels don't, but there are some watch outs.

Here are some tips on operating Cummins Natural Gas engines when temps are below freezing:

1. **Allow the engine to warm up.** For better performance and to eliminate the chance of freezing up the fuel system, let the engine idle or run at low load for the first 5 minutes. It may not be enough to have a warm cab, but it typically is enough to keep the fuel regulators from freezing up and heated oxygen sensors to be up to temperature.
2. **Limit Idle Time.** In contrast to #1, I'm going to tell you to not idle the engines excessively. During idle there is a chance for excess water to be created due to the combustion process and this water then can get into the intake and oil system. During warm weather this isn't an issue, but when cold outside, this water takes longer to evaporate out. If it is necessary to idle for an extended period, occasionally operate the engine off idle to help clear up some of the moisture. Additionally, I recommend a **short period of high idle prior to shut down** to help clear the water out of the CCV and EGR system. Otherwise this water can freeze in the CCV or EGR system and potentially create a blockage.
3. **Reference Service Bulletin.** Additionally, Cummins has published guidelines that outline steps to take to ensure successful operation.

They can be found in ***Operation of Automotive Natural Gas Engines in Cold Climates, Cummins Service Bulletin 4332709***; this bulletin is available on Quick Serve Online, or through your local Cummins representative. This bulletin provides several steps to take; including using a winter front, pulling intake air from under hood, reducing parasitic pto load by using a winter weight hydraulic oil, coolant heater options, and other items to consider.

<https://quickserve.cummins.com/qs3/pubsys2/xml/en/bulletin/4332709.html>

## How to Avoid the Most Common Mistakes Fleets Make on Maintenance

### 1. Establishing Maintenance Intervals

- a. Intervals should be hours of operation, not miles
  - Calculate based upon your fleet's actual average speed (including idle time)
  - Engine hours are best obtained through Insite (no calculation needed)
  - **Example:** (500hr interval) X (Ave MPH from Insite) = miles driven in 500 hrs.
- b. Only use **CES 20092** oil for best additive package
- c. Do all required maintenance **on time** (see Cummins recommended maintenance schedule below)
  - Extended or missed oil drain intervals will lead to engine damage
  - Oxidized or depleted engine oil appears to be clean - oxidation is not visible to the naked eye.
- d. Change spark plug before you experience engine skipping (Refer to May's Edition of Tech Talk for more details):
  - Prevents unburnt fuel from reaching the catalyst
  - Prevents Check Engine Lights on the dash
  - Use Cummins Genuine Parts

### Resources:

#### Minimum methane number requirement for Cummins Natural Gas Engines:

C Gas Plus, B Gas Plus, and L Gas Plus	65
ISL G, ISX12 G, ISB6.7 G, and all 2018 engines	75

#### Fuel Quality Calculator:

<https://www.cumminswestport.com/fuel-quality-calculator>

#### Recommended Maximum GVW for Best Performance & Efficiency:

B6.7N	33,000lbs
L9N	66,000lbs
ISX12N	80,000lbs

ISB6.7 G & B6.7N Maintenance Intervals	
	Hours
Oil & Filter* - CES 20085	500
Oil & Filter* - CES 20092	750
Spark Plugs	750
Fuel Filter	1,000
Valve Adjustment	1,500
Crankcase Breather	2,000
Ignition Coil Extension	5,000

ISL G & L9N Maintenance Intervals	
	Hours
Oil & Filter* - CES 20085	500
Coolant Filter	500
Oil & Filter* - CES 20092	1,000
Fuel Filter	1,000
Valve Adjustment	1,000
Spark Plugs	1,500
Crankcase Breather Filter - L9N	2,000
Standard Coolant	2,000
Ignition Coil Extension	10,000

ISX12 G & ISX12 N Maintenance Intervals	
	Hours
Oil & Filter* - CES 20085	500
Oil & Filter* - CES 20092	1,000
Spark Plugs	1,000
Coolant Filter	1,500
Standard Coolant	6,000
Valve Adjustment	1,000 / 3,000
Ignition Coil Extension	10,000
Crankcase Breather Filter - ISX12N	10,000

\*Per Cummins QSOL

ISB6.7 G & B6.7N Maintenance Part Numbers		
Component	Cummins Part #	Fleetguard Part #
Oil Filter	3937736	LF3970
Fuel Filter	3607140	NG5900
Crankcase Filter	5288839	x
Spark Plug Kit**	4376564	x
Ignition Coil Extension	5402163	x

\*\*Kit includes spark plug and pregreased boot

ISL G & L9N Maintenance Part Numbers		
Component	Cummins Part #	Fleetguard Part #
Oil Filter	3401544	LF9009
Fuel Filter	3607140	NG5900
Crankcase Filter*	5288839	x
Spark Plug Kit**	5473009	x
Ignition Coil Extension	5265337	x

\*If equipped

\*\*Kit includes spark plug and pregreased boot

ISX12 G & ISX12 N Maintenance Part Numbers		
Component	Cummins Part #	Fleetguard Part #
Oil Filter	4367100	LF14000NN
Fuel Filter*	3607140	NG5900
Crankcase Filter*	4389517	CV53009
Spark Plug Kit**	4309391	x
Ignition Coil Extension	4387015	x

\*If equipped

\*\*Kit includes spark plug and pregreased boot

## CES 20092 Oil Provider Recommendations

Company Name	Product Name	Vis Grade
Valvoline	Premium Blue 9200 - One Solution 10W-30	10W-30
Valvoline	Premium Blue 9200 - One Solution 15W-40	15W-40

### Alternatives

Company Name	Product Name	Vis Grade
Association of Independent Oil Distributors	Purus TFO Synthetic Blend CK-4/SN	15W-40
Association of Independent Oil Distributors	Purus TFO Synthetic Blend CK-4/SN	10W-30
Castrol Ltd.	Castrol Duratec ES 15W-40	15W-40
Castrol Ltd.	Castrol Vecton Long Drain NG 15W-40	15W-40
CITGO Petroleum Corporation	Citgard® CNG/LNG Engine Oil 10W-30	10W-30
CITGO Petroleum Corporation	Citgard® CNG/LNG Engine Oil 15W-40	15W-40
Petro-Canada Lubricants Inc	Duron GEO LD 10W-30	10W-30
Petro-Canada Lubricants Inc	Duron GEO LD 15W-40	15W-40
SINOPEC LUBRICANT CO. LTD.	Sinopec Tulux G600 CNG/LNG/LPG 15W-40	15W-40
TongYi Petroleum Chemical Co.	TongYi Long Range Gas Engine Oil LPG/CNG	10W-30
TongYi Petroleum Chemical Co.	TongYi Long Range Gas Engine Oil LPG/CNG	15W-40
TongYi Petroleum Chemical Co.	TongYi Long Range Gas Engine Oil LPG/CNG/LNG 15W-40	15W-40
TOTAL LUBRIFIANTS	Total Rubia Gas 9M 15W-40	15W-40
TOTAL LUBRIFIANTS	Total Rubia Gas 9M FE 10W-30	10W-30