

# May's Edition of Natural Gas Engine Tech Talk

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Jason Bauer lives in Indiana, has a bachelor's degree from Mechanical Engineering from the University of Michigan, has worked on Cummins Natural Gas engines since starting work with Cummins in 2004. Jason works directly with Cummins Natural Gas product development teams and customers alike identifying and sharing best practices, identifying emerging product or support issues. Please feel free to reach out to Jason should you have any questions about our natural gas engine products or support.

**This month's topic:** ISX12G/N maintenance intervals was very well received. This month I'll cover the maintenance intervals for the 6.7 and 9-liter engines, a few top tips for spark plugs, and a recommendation on reducing oil temps on the ISX12G.

## ISL G / L9N Engine Maintenance

<b>ISL G &amp; L9N Maintenance Intervals</b>	
	<b>Hours</b>
<b>Oil &amp; Filter* - CES20085</b>	500
<b>Coolant Filter</b>	500
<b>Oil &amp; Filter* - CES20092</b>	1,000
<b>Fuel Filter</b>	1,000
<b>Valve Adjustment</b>	1,000
<b>Spark Plugs</b>	1,500
<b>Crankcase Breather Filter - L9N</b>	2,000
<b>Standard Coolant</b>	2,000
<b>Ignition Coil Extension</b>	10,000

**Note:** Oil drain interval depends on oil type used

<b><u>ISL G &amp; L9N Maintenance Part Numbers</u></b>		
<b><u>Component</u></b>	<b><u>Cummins Part #</u></b>	<b><u>Fleetguard Part #</u></b>
Oil Filter	4367100	LF14000NN
Fuel Filter	3607140	NG5900
Crankcase Filter*	5366664	
Spark Plug Kit**	5473009	
Ign Coil Extension	5265337	
* L9N ONLY		
** Kit includes spark plug and pregreased boot		
<b><u>Tools</u></b>		
Spark Plug Socket	3824876	
Alcohol Prep Pads		

**B6.7N Engine Maintenance**

<b>ISB6.7 G &amp; B6.7N Maintenance Interval</b>	
	<b>Hours</b>
<b>Oil &amp; Filter* - CES 20085</b>	500
<b>Oil &amp; Filter* - CES 20092</b>	750
<b>Spark Plugs</b>	750
<b>Fuel Filter</b>	1,000
<b>Valve Adjustment</b>	1500
<b>Crankcase Breather</b>	2,000
<b>Ignition Coil Extension</b>	5,000

<b>ISB6.7 G &amp; B6.7N Maintenance Part Numbers</b>			
<b>Component</b>	<b>Cummins Part #</b>	<b>Fleetguard Part #</b>	
Oil Filter	4367100	LF14000NN	
Fuel Filter	3607140	NG5900	
Crankcase Filter*	5288839		
Spark Plug Kit**	4376564		
Ign Coil Extension	5364189		
* B6.7N ONLY			
** Kit includes spark plug and pregreased boot			
<b>Tools</b>			
Spark Plug Socket	3824876		
Alcohol Prep Pads			

**Note:** Oil drain interval depends on oil type used

**ISX12 N/G Engine Maintenance**

<b>ISX12N Maintenance Intervals</b>	
	<b>Hours</b>
<b>Oil &amp; Filter*- CES20085</b>	500
<b>Oil &amp; Filter*- CES20092</b>	1,000
<b>Spark Plugs</b>	1,000
<b>Coolant Filter</b>	1,500
<b>Standard Coolant</b>	6,000
<b>Valve Adjustment</b>	1,000 / 3,000
<b>Ignition Coil Extension</b>	10,000
<b>Crankcase Breather Filter - ISX12N</b>	10,000
* Per Cummins QSOL	

**Why doesn't my ISX12N have the dual fuel filter like the ISX12G?**

The dual fuel filter is not required on the ISX12N. However, filtering of the fuel is required. This is typically covered by a high-pressure filter that is in the CNG fuel system, however if no other upstream filter is installed, then the dual filter set up that is on the ISX12G can be used. This highlights one of the benefits of the new ISX12N, the engine fuel system is not sensitive to oil in the fuel. There is no Gas Mass Flow sensor or Fuel Control Valve to contaminate with compressor oil.

**Specific details from the Cummins Application Engineering Bulletin:**

**Req 25362.00:** If using an ISX12N the OEM fuel system supplier or body builder must install a fuel filter upstream of the engine with a

98.7 % efficiency at 10 micron or smaller particle rating.

*Note: Failure to install a compliant filter may result in engine or component damage.*

The 2018 ISX12N engine requires a fuel filter with 98.7% efficiency at 10 micron or smaller particle rating to prevent any damage to

the fuel system or engine. This can be achieved by the use of Cummins supplied options on the low-pressure side, or with hardware installed by the fuel system supplier, OEM, or bodybuilder on the high- or low-pressure

sides of the system. If the fuel system hardware already meets this requirement, no further filtration is needed. Consult with your fuel system supplier to determine if they meet this requirement.

### **Spark Plugs**

One of the biggest drivers of unplanned maintenance events on your Cummins Westport Natural Gas engine is engine skip or misfire from worn out, damaged, or miss-handled spark plugs. Three best practices I would like to share with you:

1. Change the spark plugs on time. The maintenance interval for the spark plug is 1000hrs for the ISX12G/N, 1500hrs for the ISL G/ L9N, and 750hrs for the ISB6.7G/B6.7N. Almost every fleet that has “premature” spark plug replacement, is actually caused by having the wrong average vehicle speed when calculating the interval or is just missing the interval. Our preventative maintenance intervals are designed such that the total usable life of the spark plug is utilized, yet the spark plug is changed prior to misfire occurring.
2. **Do NOT** adjust the gap your new spark plugs and if you want to check the gap before installing only use a wire/pin style gauge like shown here.  
These are available through Cummins (pn 5394864) or through other automotive parts suppliers such as Summit Racing, Napa, etc.  
**\*Just search for CT-466\***

The blade/leaf style or the flat disk gap gauges damage the precious metal that is on the electrode of the new spark plug. If you have a new spark plug that appears to be out of spec, just return it for a replacement, do NOT adjust the gap.

3. Always use genuine Cummins spark plugs in your Cummins natural gas engines. Spark plugs are an emissions related component. We have extensively tested and validated these plugs to meet the emissions certification of your engine. Aftermarket spark plugs have not been proven to meet the emissions certification.

### **Oil Thermostats on ISX12G**

To help reduce oil degradation, Cummins recommends changing the oil thermostat in ISX12G engines manufactured prior to November 2017 to a lower temperature thermostat. The new recommended oil thermostat is Cummins part number 4952631. All ISX12N engines come with this lower temperature oil thermostat from the factory. With this new, lower temperature thermostat in conjunction with an engine oil that meets Cummins spec CES20092; we have seen an increased resistance to oil coking in pistons and main seals on ISX12G/N.

### **Cummins New Natural Gas Engine Oil Standard CES 20092**

This new specification will provide significantly improved oxidation and thermal stability compared to previous natural gas oils. All CWI engines using stoichiometric combustion are compatible with CES 20092 oils. These platforms will benefit from a transition to CES 20092 oils, which require a more modern oil additive system than previously used for CES 20074 or CES 20085 oils. The new specification requires a much stronger antioxidant combination to provide protection at the



high temperatures experienced in modern natural gas engines. The range of allowable ash levels for CES 20092 oils (0.7-0.9%) is similar to the CES 20085 specification.

**CES 20092 Domestic Oil Providers**

Company Name	Product Name	Vis Grade	Gasoline, Natural Gas, Diesel	Natural Gas Only
Valvoline	Premium Blue 9200 – One Solution 10W-30	10W-30	x	
Valvoline	Premium Blue 9200 – One Solution 15W-40	15W-40	x	
Castrol Ltd.	Castrol Duratec ES 15W-40	15W-40		x
Castrol Ltd.	Castrol Vecton Long Drain NG 15W-40	15W-40		x
CITGO Petroleum Corporation	Citgard CNG/LNG Engine Oil 10W-30	10W-30	x	
CITGO Petroleum Corporation	Citgard CNG/LNG Engine Oil 15W-40	15W-40	x	

\*Also listed on QuickServe Online\*

**NEW - ISX12G Overhaul Kit**

<b>ISX12G Overhaul Kit - 557913200</b>		
Part Number	Description	Quantity
437627100	Kit, Engine Piston	6
288195800	Kit, Liner	6
288196100	Kit, Main Bearing	1
430917400	Kit, Con Rod Bearing	6
430939100	Kit, Spark Plug	6
437646600	Kit, Upper Engine Gasket	1
497506900	Gasket, Oil Pan	1