



# IPD TECH BULLETIN

## *Indicators and possible causes of common engine problems for heavy duty diesel engines*

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### COMMON INDICATORS AND CAUSES:

With all the variations in diesel engine designs running in equipment today it's almost impossible to make a complete list of the symptoms and causes you may encounter. This tech bulletin is not meant to be considered as a complete list of those indicators and/or their causes. But, hopefully will provide you with a general list of possible causes related to some of the more common complaints you may hear concerning diesel engines. Indicators and causes vary between engine models, applications and design. As you review the list below you will most likely be able to add additional information based from your own experiences

#### Problem Indicators:

#### Possible Causes (not in order of probability)

<b>Excess black smoke during full load</b> (un-burnt fuel)	<ul style="list-style-type: none"> <li>✓ Faulty electronic sensor(s)</li> <li>✓ Fuel ratio control setting</li> <li>✓ Intake or exhaust restriction (plugged air cleaner?)</li> <li>✓ Lugging</li> <li>✓ Over fueling or Over loading</li> <li>✓ Valve adjustment</li> <li>✓ Failing turbocharger</li> </ul>
<b>Blue smoke</b> (oil consumption)	<ul style="list-style-type: none"> <li>✓ Oil Leaks</li> <li>✓ High oil level resulting from other problems</li> <li>✓ General engine wear due hours of operation               <ul style="list-style-type: none"> <li>○ Worn piston rings &amp; liners</li> <li>○ Worn valve train components</li> <li>○ Worn turbocharger</li> </ul> </li> </ul>
<b>White Smoke</b> (water in combustion chamber or un-burnt fuel at start up)	<ul style="list-style-type: none"> <li>✓ Faulty electronic sensor(s)</li> <li>✓ Cold ambient air temperature</li> <li>✓ Leaking head gasket</li> <li>✓ Cracked head and/or liners</li> <li>✓ Faulty injector(s)</li> <li>✓ Incorrect starting procedure</li> <li>✓ Quality of the fuel</li> </ul>
<b>Increased oil consumption or Blow-by</b>	<ul style="list-style-type: none"> <li>✓ Oil leaks</li> <li>✓ Quality and type of oil</li> <li>✓ Air compressor</li> <li>✓ Normal engine wear               <ul style="list-style-type: none"> <li>○ Worn or broken rings/liners</li> <li>○ Worn turbocharger seals</li> <li>○ Worn valve guides</li> </ul> </li> <li>✓ Over loading</li> <li>✓ Prolonged idling</li> </ul>
<b>Unusual noises</b>	<ul style="list-style-type: none"> <li>✓ Malfunctioning fuel nozzle/injectors</li> <li>✓ Worn engine components</li> <li>✓ Turbocharger</li> <li>✓ Too much valve lash</li> </ul>

<b>Lack of power</b>	<ul style="list-style-type: none"> <li>✓ Faulty electronic sensor(s)</li> <li>✓ Intake or exhaust restriction (plugged air cleaner?)</li> <li>✓ Fuel restriction</li> <li>✓ Fuel components</li> <li>✓ Governor settings</li> <li>✓ Transmission, Torque Converter, or other components</li> <li>✓ Fuel quality</li> </ul>
<b>Increased fuel consumption</b>	<ul style="list-style-type: none"> <li>✓ Fuel leak</li> <li>✓ Faulty electronic sensor(s)</li> <li>✓ Intake or exhaust restriction (plugged air cleaner?)</li> <li>✓ Turbocharger</li> <li>✓ Fuel components</li> <li>✓ Operator</li> </ul>
<b>Overheating</b>	<ul style="list-style-type: none"> <li>✓ Faulty electronic sensor(s)</li> <li>✓ Plugged radiator</li> <li>✓ Incorrect adjustment or worn belts/pulleys</li> <li>✓ Low coolant level</li> <li>✓ Malfunctioning temperature regulators</li> <li>✓ Failing water pump</li> <li>✓ Operator</li> </ul>
<b>Hard starting</b>	<ul style="list-style-type: none"> <li>✓ Worn fuel components</li> <li>✓ Faulty electronic sensor(s)</li> <li>✓ Improper starting technique</li> <li>✓ Fuel quality</li> <li>✓ Low cranking speed</li> </ul>
<b>Oil level over full</b>	<ul style="list-style-type: none"> <li>✓ Coolant or fuel dilution of oil</li> <li>✓ Over filling</li> </ul>
<b>Debris in oil filter</b>	➤ Never a good sign!

In most cases a good maintenance program will prevent or identify problems before they progress into something major. Qualified technicians, with the correct tools are essential in diagnosing and repairing problems correctly.

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