

How to perform an engine test

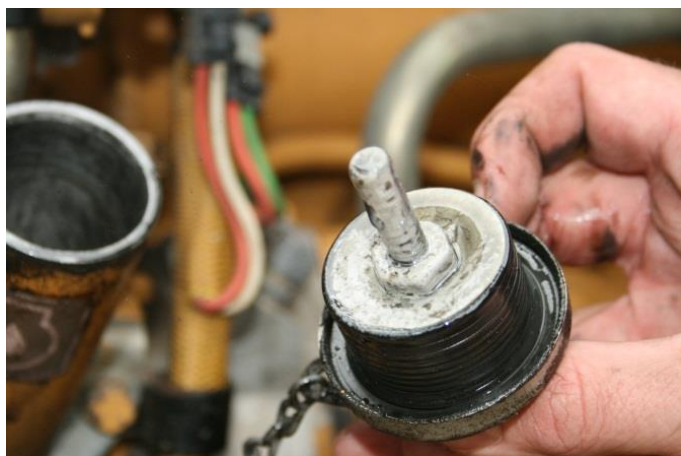
This article is about how to check the engine of an excavator, wheel-loader, bulldozer or any other machine with a combustion engine.

If someone intends to purchase a used machine with a combustion engine, it would be recommended performing a profound engine test and to investigate the engine condition. The engine is a major component in an earthmoving machine and if a replacement or a major repair is required the cost of it might in some cases extend the value of the whole machine.

For engine inspection of a wheel loader, excavator, bulldozer or any other used construction machine with a combustion engine, we recommend the following procedure:

- Before turning the key, have a look if the engine is cold. If the supplier warmed up engine already this may be a sign of starting problems with a cold engine (compression).
- Check the oil condition. New oil along with old air- and fuel filters and no other signs of service should alert.
- Now open the cooler reservoir and have a look to coolant quality. There should not be plain water in and the coolant should be more or less clear. It should not smell for diesel fuel and should not contain any oil.
- Keep the cooler reservoir open and start engine. No signs of pressure in coolant reservoir should occur. Watch the smoke on start. A bit grey or black smoke should disappear after max. 30sec.
- If engine has been steam-cleaned previously keep it running until oil temperature reached at least 60°C and check again for leaks.

Now it is time to check the so called Blow-By. When an engine is running a certain amount of pressure from the combustion is bypassing pistons and piston rings and finds its way to the crankshaft case. Therefore a vent line is existing and accessible with most of the engines. (With some modern engines this hose leads back to the air inlet channel to return the gas to the engine.) Professional inspection service providers can also offer a blow-through measuring and compare the amount with original machine configuration.



To check the Blow-By open the oil filler cap and put your hand on. It is difficult to describe the level of allowed Blow-By. However, to give you a feeling: Blow through your nose at your hand. If the level of engine wear is normal it should be less than that. Engine must run in idle!

The filler cap should not contain gray paste. This would be a sign of water in oil. Also the dipstick should not be covered with an oil-water mixture.

Now you can perform other machine tests like a Stall-Test or Cycle Time Test. Before you perform it warm up the engine to operating temperature! Run the engine in working speed and watch the smoke. A bit black smoke is normal under load. More black smoke occurs when the fuel is not combusted completely. Blue smoke indicates that the fuel gets mixed up with oil somewhere before burning. Unburned fuel which gets into the exhaust stream is responsible for white smoke.

After running the engine for 20 minutes you can have a look back at it. Take a flash light and watch for leaks.

Additional checks:

- Condition of belts and pulleys
- Condition of attachments such as air conditioner, alternator, starter, water pump and oil pump
- Check of radiators and coolant reservoir
- Check for fuel leaks



For engines with high hour level and on machines with a higher value it is also recommended to do an oil analysis. The inspector draws an amount of engine oil to a clean bottle and sends it to a laboratory for analysis. But it makes only sense as long as you know for how long the oil was in use.

You would prefer to give such inspection job to professionals in heavy machinery? [Call Mevas](#) for a quotation of machine or engine inspection. We inspect machines on an international base. With a network of engineers and partners we cover many countries around the globe.

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[Torque Converter Stall Test](#)