

What is underloading a diesel generator? What is wet stacking or low loading?

The Evopower and Hyundai range of 1500rpm diesel generators are set to produce 50Hz stable frequency output in line with UK (and other) country mains supply and devices. This is achieved by having a stable* 1500rpm engine speed.

To maintain 1500rpm, the fuel being pumped into the engine is varied depending upon the load which is being applied - the more load being applied, the more fuel it takes to maintain the engine at 1500rpm speed and vice versa.

If you run a diesel generator on very light loads, the engine is unlikely to reach an adequate temperature as it is burning or combustion less fuel and generally working too light.

The optimum temperature for a diesel generator is when it is being used to power between 30% to 80% of its rated power output.

How does it happen and what does it cause?

If you consistently run a diesel generator for less than 30% of its rated output, you are likely to cause wet-stacking, or underloading as the engine is not being worked hard enough to reach the right temperature and combust all of the fuel being pumped into the engine.

When the engine is not reaching an adequate temperature, some of the fuel which is being supplied into the combustion chamber is not burned/spent. This unburned fuel then glazes the cylinder bores, reduces the efficiency and compression within the chambers and the unburned fuel causes carbon build up on the injectors.

This unspent fuel also causes a large build up of soot, and in extreme cases some of the unburnt fuel can mix with this soot and travel through the engine into the silencer and exhaust.

This unburnt fuel leads to a potential fire risk - if the generator is suddenly or subsequently placed under a large/full load, the temperature of the exhaust fumes will heat the silencer up to an extreme level and the unburnt fuel mixture could ignite.

How can I tell if my generator is being underloaded?

Ideally you should know the load that you are applying and you would have worked this out when deciding what generator to purchase. However, if not, the first signs are usually very heavy smoke coming from the exhaust while the generator is on, or the soot and fuel mixture which has made its way to the exhaust silencer will seep out. This mixture appears to be an oil leak as the unburnt diesel and soot forms a thick oil like substance which is very dark and heavy.

How can I prevent wet stacking?

In the first instance, before purchasing a generator, make sure you always spec the generator to the correct load. It is *usually* easiest to work out the max amperage draw of your load and then spec a generator so the amps you are expecting to use, equate to around 80% of the output of the generator. A suitably qualified technician or electrician should be consulted on your project.

How can I 'fix' underloading or wet stacking?

If your generator has already suffered from underloading, you should look at implementing a load bank programme. You can usually prevent underloading by making sure you run the generator on three quarters or 75% of its prime rated capacity, for around 2 hours in every 100 hours use.

If you implement a programme to ensure the generator is brought up to 75% to 100% of its prime load capacity in a controlled manner, this can gradually burn off the carbon deposits and the unburnt soot/fuel mix and prolong the life of your genset.

Failure to fix underloading can cause permanent damage to your engine and generator and will void any warranty terms in place.