



Diesel Engine Testing for Underground Coal Mines

By Geoff Staples, Mechanical Technical Officer, Dyno/Diesel Specialist

Underground coal mines generally produce highly flammable methane gas as a by-product of the mining process. This is particularly the case in NSW underground mines where gas is often released in such quantity that it can be utilised as an energy source for both our homes and industry. Its flammability means that all equipment used in these mines has to be approved to certain safety requirements, to prevent the likelihood of an explosion or fire.

We have all seen various types of earthmoving machines in use, digging, loading carrying etc. It is not possible to use these same machines underground because they have not been built to comply with the relevant standard, AS/NZS 3584. This standard requires specific design, construction and testing of machines, to make them safe for use in what can be the hazardous environment, of an underground coal mine. This means machines generally have to be specially built. They are similar in operation to what is seen on earthmoving sites, but are usually more compact, to enable them to be used within the confines of a mine. The diesel engines that power these machines have to go through modifications and testing, before they are approved for use.

TestSafe provides a highly valued testing service, to prove these engines comply with the standard.

The engines are fitted with flametraps in the intake and exhaust systems. These are assessed by a series of tests, whereby various flammable gas mixes are ignited inside these systems to prove the flame doesn't propagate to the surrounding atmosphere.

Engine packages are tested on a dynamometer, for performance characteristics, surface temperatures and exhaust emissions.

Various safety shutdown systems are also tested for operation. These systems are in place, to stop the engine, should any of a variety of conditions move outside certain parameters.

The mining machines, in which these diesel engines are installed, are used in Australia and are in some cases exported.

If you see a new, diesel powered underground mining machine, it most likely will have had the diesel engine system, approval tested at TestSafe.

