# POSITION PAPER

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## SPARK ARRESTORS FOR DIESEL-POWERED EARTHMOVING MACHINERY

CMEIG members have recently received inquiries regarding whether diesel engines with turbochargers and/or a Diesel Particulate Filter (DPF) require a separate spark arrestor. For this paper, the following definition of a spark arrestor applies:

*"A device, system or method which controls the emission from an engine exhaust of particles potentially capable of igniting combustible material in the vicinity by virtue of their size and temperature." – AS 1019:2000*

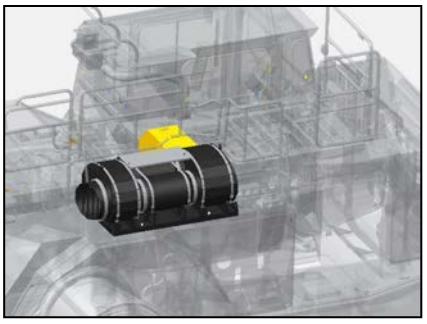

*Figure 1 – a modern earthmoving machine diesel engine DPF*

**CMEIG position:**

- Diesel engine systems with turbocharger/s where all exhaust gases pass through the turbocharger/s under all operating conditions (i.e. no turbocharger wastegate/bypass) do not require a separate spark arrestor.

- Irrespective of whether a diesel engine system has turbocharger/s with or without a wastegate/bypass, diesel engine systems where 100% of exhaust gases flow through a Wall-flow DPF, and where there is a visual or audible warning when the DPF requires regeneration, cleaning or replacement, do not require a separate spark arrestor.

**This position is derived from the following sources of guidance:**

***AS 1019:2000 - Internal combustion engines—Spark emission control devices***[1] provides guidance on facets related to internal combustion engine spark arrestors. Particularly relevant, it considers the following to comply with AS 1019:2000:

- A spark arrestor that meets the applicable requirements of AS 1019:2000
- Alternative designs incorporating an integral part that acts as a spark arrestor according to established test criteria

[1] A copy of AS 1019:2000 can be purchased from the following link

- Engines where all exhaust gases pass through a turbocharger under all operating conditions (i.e. engine-turbocharger arrangements without a wastegate/bypass)
- Engines where the gas path that does not pass through a turbocharger (e.g. wastegate/bypass) is fitted with a spark arrestor, or an alternative design as mentioned above.

Note that this standard is currently 19 years old. Diesel engine and engine emissions systems have advanced substantially since this standard was originally written. In particular, AS 1019 does not address modern Wall-flow DPF systems.

**United States Department of Agriculture, Forest Service Standard 5100-1D**[2] was published in 2013, and provides substantive clarity regarding modern diesel engines and spark arrestors. It clarifies that engines using a Wall-flow DPF do not require a separate spark arrester if 100% of exhaust gases flow through the DPF, and there is a visual or audible warning when the filter requires regeneration, cleaning or replacement.

For more information, contact your product manufacturer, supplier or authorised agent.

[2] A copy of USDA Forestry Service Standard 5100-1D is freely available at the following link