

§ 7.68

(5) There shall be no water inside the blasting unit enclosure, except for the battery compartment.

§ 7.68 Firing line terminals test.

(a) *Test procedures.* (1) The contact resistance through each firing line terminal shall be determined.

(2) A 10-pound pull shall be applied to a No. 18 gauge wire that has been connected to each firing line terminal according to the manufacturer's instructions.

(b) *Acceptable performance.* (1) The contact resistance shall not be greater than 1 ohm.

(2) The No. 18 gauge wire shall not become disconnected from either firing line terminal.

§ 7.69 Approval marking.

Each approved blasting unit shall be identified as permissible by a legible and permanent marking securely attached, stamped, or molded to the outside of the unit. This marking shall include the following:

(a) The assigned MSHA approval number.

(b) The maximum blasting circuit resistance.

(c) A warning that the unit's components must not be disassembled or removed.

(d) The replacement battery types if the unit has replaceable batteries.

(e) A warning placed next to the charging connector that the battery only be charged in a fresh air location if rechargeable batteries are used.

(f) A warning that the unit is compatible only with detonators that will—

(1) Fire when an average of 1.5 amperes is applied for 5 milliseconds;

(2) Not misfire when up to an average 100 amperes is applied for 10 milliseconds; and

(3) Not fire when a current of 250 milliamperes or less is applied.

§ 7.70 Post-approval product audit.

Upon request by MSHA, but not more than once a year except for cause, the approval holder shall make an approved blasting unit available for audit at no cost to MSHA.

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§ 7.71 Approval checklist.

Each blasting unit bearing an MSHA approval marking shall be accompanied by a description of what is necessary to maintain the blasting unit as approved.

[54 FR 48210, Nov. 21, 1989, as amended at 60 FR 33723, June 29, 1995]

§ 7.72 New technology.

MSHA may approve a blasting unit that incorporates technology for which the requirements of this subpart are not applicable if the Agency determines that the blasting unit is as safe as those which meet the requirements of this subpart.

Subpart E—Diesel Engines Intended for Use in Underground Coal Mines

SOURCE: 61 FR 55504, Oct. 25, 1996, unless otherwise noted.

§ 7.81 Purpose and effective date.

Subpart A general provisions of this part apply to this subpart E. Subpart E establishes the specific engine performance and exhaust emission requirements for MSHA approval of diesel engines for use in areas of underground coal mines where permissible electric equipment is required and areas where non-permissible electric equipment is allowed. It is effective November 25, 1996.

§ 7.82 Definitions.

In addition to subpart A definitions of this part, the following definitions apply in this subpart.

Brake Power. The observed power measured at the crankshaft or its equivalent when the engine is equipped only with standard auxiliaries necessary for its operation on the test bed.

Category A engines. Diesel engines intended for use in areas of underground coal mines where permissible electric equipment is required.

Category B engines. Diesel engines intended for use in areas of underground coal mines where nonpermissible electric equipment is allowed.

Corrosion-resistant material. Material that has at least the corrosion-resistant properties of type 304 stainless steel.

Diesel engine. Any compression ignition internal combustion engine using the basic diesel cycle where combustion results from the spraying of fuel into air heated by compression.

Exhaust emission. Any substance emitted to the atmosphere from the exhaust port of the combustion chamber of a diesel engine.

Intermediate speed. Maximum torque speed if it occurs between 60 percent and 75 percent of rated speed. If the maximum torque speed is less than 60 percent of rated speed, then the intermediate speed shall be 60 percent of the rated speed. If the maximum torque speed is greater than 75 percent of the rated speed, then the intermediate speed shall be 75 percent of rated speed.

Low idle speed. The minimum no load speed as specified by the engine manufacturer.

Maximum torque speed. The speed at which an engine develops maximum torque.

Operational range. All speed and load (including percent loads) combinations from the rated speed to the minimum permitted engine speed at full load as specified by the engine manufacturer.

Particulates. Any material collected on a specified filter medium after diluting exhaust gases with clean, filtered air at a temperature of less than or equal to 125 °F (52 °C), as measured at a point immediately upstream of the primary filter. This is primarily carbon, condensed hydrocarbons, sulfates, and associated water.

Percent load. The fraction of the maximum available torque at an engine speed.

Rated horsepower. The nominal brake power output of a diesel engine as specified by the engine manufacturer with a specified production tolerance. For laboratory test purposes, the fuel pump calibration for the rated horsepower must be set between the nominal and the maximum fuel tolerance specification.

Rated speed. Speed at which the rated power is delivered, as specified by the engine manufacturer.

Steady-state condition. Diesel engine operating condition which is at a constant speed and load and at stabilized temperatures and pressures.

Total oxides of nitrogen. The sum total of the measured parts per millions (ppm) of nitric oxide (NO) plus the measured ppm of nitrogen dioxide (NO₂).

§ 7.83 Application requirements.

(a) An application for approval of a diesel engine shall contain sufficient information to document compliance with the technical requirements of this subpart and specify whether the application is for a category A engine or category B engine.

(b) The application shall include the following engine specifications—

- (1) Model number;
- (2) Number of cylinders, cylinder bore diameter, piston stroke, engine displacement;
- (3) Maximum recommended air inlet restriction and exhaust backpressure;
- (4) Rated speed(s), rated horsepower(s) at rated speed(s), maximum torque speed, maximum rated torque, high idle, minimum permitted engine speed at full load, low idle;
- (5) Fuel consumption at rated horsepower(s) and at the maximum rated torque;
- (6) Fuel injection timing; and
- (7) Performance specifications of turbocharger, if applicable.

(c) The application shall include dimensional drawings (including tolerances) of the following components specifying all details affecting the technical requirements of this subpart. Composite drawings specifying the required construction details may be submitted instead of individual drawings of the following components—

- (1) Cylinder head;
- (2) Piston;
- (3) Inlet valve;
- (4) Exhaust valve;
- (5) Cam shaft—profile;
- (6) Fuel cam shaft, if applicable;
- (7) Injector body;
- (8) Injector nozzle;
- (9) Injection fuel pump;
- (10) Governor;
- (11) Turbocharger, if applicable;
- (12) Aftercooler, if applicable;
- (13) Valve guide;