

**§ 36.26 Composition of exhaust gas.**

(a) *Preliminary engine adjustment.* The engine shall be submitted to MSHA by the applicant in such condition that it can be tested immediately at full load and speed. The preliminary liquid-fuel-injection rate shall be such that the exhaust will not contain black smoke and the applicant shall adjust the injection rate promptly to correct any adverse conditions disclosed by preliminary tests.

(b) *Final engine adjustment.* The liquid fuel supply to the engine shall be adjusted so that the undiluted exhaust gas shall contain not more than 0.30 percent, by volume, of carbon monoxide or 0.20 percent, by volume, of oxides of nitrogen (calculated as equivalent nitrogen dioxide, NO<sub>2</sub>) under any conditions of engine operation prescribed by MSHA when the intake air mixture to the engine contains 1.5±0.1 percent, by volume, of Pittsburgh natural gas.<sup>3</sup>

(c) *Coupling or adapter.* The applicant shall provide the coupling or adapter for connecting the engine to MSHA's dynamometer.

NOTE: Preferably this coupling or adapter should be attached to the flywheel of the engine.

Clutches, transmissions, or torque converters ordinarily are not required in the coupling train.

**§ 36.27 Fuel-supply system.**

(a) *Fuel tank.* (1) The fuel tank shall not leak and shall be fabricated of metal at least 1/16 inch thick, welded at all seams, except that tanks of 5 gallons or less capacity may have thinner walls which shall be preformed or reinforced to provide good resistance to deflection. A drain plug (not a valve or petcock) shall be provided and locked in position. A vent opening shall be provided in the fuel filler cap of such design that atmospheric pressure is maintained inside the tank. The size of the vent opening shall be restricted to prevent fuel from splashing through it. The filler opening shall be so arranged

<sup>3</sup> Investigation has shown that for practical purposes, Pittsburgh natural gas (containing a high percentage of methane) is a satisfactory substitute for pure methane in these tests.

that fuel can be added only through a self-closing valve at least 1 foot from the exhaust manifold of the engine, preferably below it. The self-closing valve shall constitute a fuel-tight closure when fuel is not being added. Any part of the self-closing valve that might become detached during the addition of fuel shall be secured to the tank by a chain or other fastening to prevent loss.

(2) The fuel tank shall have a definite position in the equipment assembly, and no provision shall be made for attachment of separate or auxiliary fuel tanks.

(3) Capacity of the fuel tank shall not exceed the amount of fuel necessary to operate the engine continuously at full load for approximately four hours.

(b) *Fuel lines.* All fuel lines shall be installed to protect them against damage in ordinary use and they shall be designed, fabricated, and secured to resist breakage from vibration.

(c) *Valve in fuel line.* A shutoff valve shall be provided in the fuel system, installed in a manner acceptable to MSHA.

NOTE: This shutoff valve is in addition to the normal shutoff provided in the fuel-injection system and also in addition to the air-shutoff valve.

**§ 36.28 Signal or warning device.**

All mobile diesel-powered transportation equipment shall be provided with a bell, horn, or other suitable warning device convenient to the operator. Warning devices shall be operated manually or pneumatically.

**§ 36.29 Brakes.**

All mobile diesel-powered transportation equipment shall be equipped with adequate brakes acceptable to MSHA.

**§ 36.30 Rerailing device.**

All mobile diesel-powered transportation equipment designed to travel on rails in haulage service shall carry a suitable rerailing device.

**§ 36.31 Fire extinguisher.**

Each unit of mobile diesel-powered transportation equipment shall be fitted with a fire extinguisher carried in a location easily accessible to the

**§ 36.26 Composition of exhaust gas.**

(a) *Preliminary engine adjustment.* The engine shall be submitted to MSHA by the applicant in such condition that it can be tested immediately at full load and speed. The preliminary liquid-fuel-injection rate shall be such that the exhaust will not contain black smoke and the applicant shall adjust the injection rate promptly to correct any adverse conditions disclosed by preliminary tests.

(b) *Final engine adjustment.* The liquid fuel supply to the engine shall be adjusted so that the undiluted exhaust gas shall contain not more than 0.30 percent, by volume, of carbon monoxide or 0.20 percent, by volume, of oxides of nitrogen (calculated as equivalent nitrogen dioxide, NO<sub>2</sub>) under any conditions of engine operation prescribed by MSHA when the intake air mixture to the engine contains 1.5±0.1 percent, by volume, of Pittsburgh natural gas.<sup>3</sup>

(c) *Coupling or adapter.* The applicant shall provide the coupling or adapter for connecting the engine to MSHA's dynamometer.

NOTE: Preferably this coupling or adapter should be attached to the flywheel of the engine.

Clutches, transmissions, or torque converters ordinarily are not required in the coupling train.

**§ 36.27 Fuel-supply system.**

(a) *Fuel tank.* (1) The fuel tank shall not leak and shall be fabricated of metal at least 1/16 inch thick, welded at all seams, except that tanks of 5 gallons or less capacity may have thinner walls which shall be preformed or reinforced to provide good resistance to deflection. A drain plug (not a valve or petcock) shall be provided and locked in position. A vent opening shall be provided in the fuel filler cap of such design that atmospheric pressure is maintained inside the tank. The size of the vent opening shall be restricted to prevent fuel from splashing through it. The filler opening shall be so arranged

<sup>3</sup> Investigation has shown that for practical purposes, Pittsburgh natural gas (containing a high percentage of methane) is a satisfactory substitute for pure methane in these tests.

that fuel can be added only through a self-closing valve at least 1 foot from the exhaust manifold of the engine, preferably below it. The self-closing valve shall constitute a fuel-tight closure when fuel is not being added. Any part of the self-closing valve that might become detached during the addition of fuel shall be secured to the tank by a chain or other fastening to prevent loss.

(2) The fuel tank shall have a definite position in the equipment assembly, and no provision shall be made for attachment of separate or auxiliary fuel tanks.

(3) Capacity of the fuel tank shall not exceed the amount of fuel necessary to operate the engine continuously at full load for approximately four hours.

(b) *Fuel lines.* All fuel lines shall be installed to protect them against damage in ordinary use and they shall be designed, fabricated, and secured to resist breakage from vibration.

(c) *Valve in fuel line.* A shutoff valve shall be provided in the fuel system, installed in a manner acceptable to MSHA.

NOTE: This shutoff valve is in addition to the normal shutoff provided in the fuel-injection system and also in addition to the air-shutoff valve.

**§ 36.28 Signal or warning device.**

All mobile diesel-powered transportation equipment shall be provided with a bell, horn, or other suitable warning device convenient to the operator. Warning devices shall be operated manually or pneumatically.

**§ 36.29 Brakes.**

All mobile diesel-powered transportation equipment shall be equipped with adequate brakes acceptable to MSHA.

**§ 36.30 Rerailing device.**

All mobile diesel-powered transportation equipment designed to travel on rails in haulage service shall carry a suitable rerailing device.

**§ 36.31 Fire extinguisher.**

Each unit of mobile diesel-powered transportation equipment shall be fitted with a fire extinguisher carried in a location easily accessible to the