

(c) Self-propelled nonpermissible heavy-duty diesel-powered equipment under §75.1908(a), except rail-mounted equipment, shall be provided with a supplemental braking system that:

(1) Engages automatically within 5 seconds of the shutdown of the engine;

(2) Safely brings the equipment when fully loaded to a complete stop on the maximum grade on which it is operated;

(3) Holds the equipment stationary, despite any contraction of brake parts, exhaustion of any nonmechanical source of energy, or leakage;

(4) Releases only by a manual control that does not operate any other equipment function;

(5) Has a means in the equipment operator's compartment to apply the brakes manually without shutting down the engine, and a means to release and reengage the brakes without the engine operating; and

(6) Has a means to ensure that the supplemental braking system is released before the equipment can be trammed, and is designed to ensure the brake is fully released at all times while the equipment is trammed.

(d) Self-propelled nonpermissible light-duty diesel-powered equipment under §75.1908(b), except rail-mounted equipment, must be provided with a parking brake that holds the fully loaded equipment stationary on the maximum grade on which it is operated despite any contraction of the brake parts, exhaustion of any nonmechanical source of energy, or leakage.

(e) The supplemental and park brake systems required by paragraphs (c) and (d) must be applied when the equipment operator is not at the controls of the equipment, except during movement of disabled equipment.

(f) Self-propelled personnel-elevating work platforms must be provided with a means to ensure that the parking braking system is released before the equipment can be trammed, and must be designed to ensure the brake is fully released at all times while the equipment is trammed.

(g) Any nonpermissible equipment that discharges its exhaust directly into a return air course must be provided with a power package approved under subpart F of part 7 of this title.

(h) Self-propelled nonpermissible heavy-duty diesel-powered equipment meeting the requirements of §75.1908(a) must be provided with an automatic fire suppression system meeting the requirements of §75.1911.

(i) Self-propelled nonpermissible light-duty diesel-powered equipment meeting the requirements of §75.1908(b) must be provided with an automatic or manual fire suppression system meeting the requirements of §75.1911.

(j) Nonpermissible equipment that is not self-propelled must have the following features in addition to those listed in paragraph (a):

(1) A means to prevent inadvertent movement of the equipment when parked;

(2) Safety chains or other suitable secondary connections on equipment that is being towed; and

(3) An automatic fire suppression system meeting the requirements of §75.1911.

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§ 75.1910 Nonpermissible diesel-powered equipment; electrical system design and performance requirements.

Electrical circuits and components associated with or connected to electrical systems on nonpermissible diesel-powered equipment utilizing storage batteries and integral charging systems, except for the special category of equipment under §75.1908(d), must conform to the following requirements:

(a) Overload and short circuit protection must be provided for electric circuits and components in accordance with §§75.518 and 75.518-1 of this part;

(b) Each electric conductor from the battery to the starting motor must be protected against short circuit by fuses or other circuit-interrupting devices placed as near as practicable to the battery terminals;

(c) Each branch circuit conductor connected to the main circuit between the battery and charging generator must be protected against short circuit by fuses or other automatic circuit-interrupting devices;

(d) The electrical system shall be equipped with a circuit-interrupting

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device by means of which all power conductors can be deenergized. The device must be located as close as practicable to the battery terminals and be designed to operate within its electrical rating without damage. The device shall not automatically reset after being actuated. All magnetic circuit-interrupting devices must be mounted in a manner to preclude their closing by force of gravity;

(e) Each motor and charging generator must be protected by an automatic overcurrent device. One protective device will be acceptable when two motors of the same rating operate simultaneously and perform virtually the same duty;

(f) Each ungrounded conductor must have insulation compatible with the impressed voltage. Insulation materials must be resistant to deterioration from engine heat and oil. Electric conductors must meet the applicable requirements of §§75.513 and 75.513-1, except electric conductors for starting motors, which must only meet the requirements of §75.513;

(g) All wiring must have adequate mechanical protection to prevent damage to the cable that might result in short circuits;

(h) Sharp edges and corners must be removed at all points where there is a possibility of damaging wires, cables, or conduits by cutting or abrasion. The insulation of the cables within a battery box must be protected against abrasion;

(i) When insulated wires other than cables pass through metal frames, the holes must be substantially bushed with insulated bushings. Cables must enter metal frames of motors, splice boxes, and electric components only through proper fittings. All electrical connections and splices must be mechanically and electrically efficient, and suitable connectors shall be used. All electrical connectors or splices in insulated wire must be reinsulated at least to the same degree of protection as the remainder of the wire;

(j) The battery must be secured to prevent movement, and must be protected from external damage by position. Batteries that are not protected from external damage by position must be enclosed in a battery box. Flame-re-

sistant insulation treated to resist chemical reaction to electrolyte must be provided on battery connections to prevent battery terminals from contacting conducting surfaces;

(k) A battery box, including the cover, must be constructed of steel with a minimum thickness of $\frac{1}{8}$ inch, or of a material other than steel that provides equivalent strength;

(l) Battery-box covers must be lined with a flame-resistant insulating material permanently attached to the underside of the cover, unless equivalent protection is provided. Battery-box covers must be provided with a means for securing them in closed position. At least $\frac{1}{2}$ inch of air space must be provided between the underside of the cover and the top of the battery, including terminals;

(m) Battery boxes must be provided with ventilation openings to prevent the accumulation of flammable or toxic gases or vapors within the battery box. The size and locations of openings for ventilation must prevent direct access to battery terminals;

(n) The battery must be insulated from the battery-box walls and supported on insulating materials. Insulating materials that may be subject to chemical reaction with electrolyte must be treated to resist such action; and

(o) Drainage holes must be provided in the bottom of each battery box.

§75.1911 Fire suppression systems for diesel-powered equipment and fuel transportation units.

(a) The fire suppression system required by §§75.1907 and 75.1909 shall be a multipurpose dry chemical type (ABC) fire suppression system listed or approved by a nationally recognized independent testing laboratory and appropriate for installation on diesel-powered equipment and fuel transportation units.

(1) The system shall be installed in accordance with the manufacturer's specifications and the limitations of the listing or approval.

(2) The system shall be installed in a protected location or guarded to minimize physical damage from routine vehicle operations.