

er or other no less effective device approved by the Secretary of adequate current-interrupting capacity in each ungrounded conductor. Disconnecting devices used to disconnect power from trailing cables shall be plainly marked and identified and such devices shall be equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

**(c) Distribution center junctions; safety connections**

When two or more trailing cables junction to the same distribution center, means shall be provided to assure against connecting a trailing cable to the wrong size circuit breaker.

**(d) Temporary splices; usable period; exceptions; quality**

One temporary splice may be made in any trailing cable. Such trailing cable may only be used for the next twenty-four hour period. No temporary splice shall be made in a trailing cable within twenty-five feet of the machine, except cable reel equipment. Temporary splices in trailing cables shall be made in a workmanlike manner and shall be mechanically strong and well insulated. Trailing cables or hand cables which have exposed wires or which have splices that heat or spark under load shall not be used. As used in this subsection, the term "splice" means the mechanical joining of one or more conductors that have been severed.

**(e) Permanent splices; quality**

When permanent splices in trailing cables are made, they shall be—

- (1) mechanically strong with adequate electrical conductivity and flexibility;
- (2) effectively insulated and sealed so as to exclude moisture; and
- (3) vulcanized or otherwise treated with suitable materials to provide flame-resistant qualities and good bonding to the outer jacket.

**(f) Clamping of cables**

Trailing cables shall be clamped to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections. Trailing cables shall be adequately protected to prevent damage by mobile equipment.

**(g) Making and breaking of connections to junction boxes**

Trailing cable and power cable connections to junction boxes shall not be made or broken under load.

(Pub. L. 91-173, title III, §306, Dec. 30, 1969, 83 Stat. 779.)

**§ 867. Grounding of equipment**

**(a) Metallic enclosed power conductors; metallic frames and other equipment; methods**

All metallic sheaths, armors, and conduits enclosing power conductors shall be electrically continuous throughout and shall be grounded by methods approved by an authorized representative of the Secretary. Metallic frames, casings, and other enclosures of electric equipment that can become "alive" through failure of insulation or by contact with energized parts shall be

grounded by methods approved by an authorized representative of the Secretary. Methods other than grounding which provide no less effective protection may be permitted by the Secretary or his authorized representative.

**(b) Frames of offtrack direct current machines; enclosures of related detached components**

The frames of all offtrack direct current machines and the enclosures of related detached components shall be effectively grounded, or otherwise maintained at no less safe voltages, by methods approved by an authorized representative of the Secretary.

**(c) Stationary high-voltage equipment powered by underground delta systems**

The frames of all stationary high-voltage equipment receiving power from ungrounded delta systems shall be grounded by methods approved by an authorized representative of the Secretary.

**(d) Repairs of high-voltage lines; exceptions**

High-voltage lines, both on the surface and underground, shall be deenergized and grounded before work is performed on them, except that repairs may be permitted, in the case of energized surface high-voltage lines, if such repairs are made by a qualified person in accordance with procedures and safeguards, including, but not limited to a requirement that the operator of such mine provide, test, and maintain protective devices in making such repairs, to be prescribed by the Secretary prior to the operative date of this subchapter.

**(e) Deenergizing of underground power circuits on idle days; exceptions**

When not in use, power circuits underground shall be deenergized on idle days and idle shifts, except that rectifiers and transformers may remain energized.

(Pub. L. 91-173, title III, §307, Dec. 30, 1969, 83 Stat. 780.)

REFERENCES IN TEXT

For the operative date of this subchapter, referred to in subsec. (d), see section 509 of Pub. L. 91-173, set out as an Effective Date note under section 801 of this title.

**§ 868. Underground high-voltage distribution**

**(a) Circuits entering underground areas of mines; circuit breakers**

High-voltage circuits entering the underground area of any coal mine shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained as prescribed by the Secretary. Such breakers shall be equipped with devices to provide protection against under-voltage, grounded phase, short circuit, and overcurrent.

**(b) Circuits extending underground and supplying equipment; direct neutral grounds; ground conductors for frames, exceptions; location of disconnection devices, exceptions**

High-voltage circuits extending underground and supplying portable, mobile, or stationary high-voltage equipment shall contain either a direct or derived neutral which shall be grounded through a suitable resistor at the source