

**§ 229.87**

High Voltage” or with the word “Danger” and the normal voltage carried by the parts so protected.

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**§ 229.87 Hand-operated switches.**

All hand-operated switches carrying currents with a potential of more than 150 volts that may be operated while under load shall be covered and shall be operative from the outside of the cover. Means shall be provided to show whether the switches are open or closed. Switches that should not be operated while under load shall be legibly marked with the words “must not be operated under load” and the voltage carried.

**§ 229.89 Jumpers; cable connections.**

(a) Jumpers and cable connections between locomotives shall be so located and guarded to provide sufficient vertical clearance. They may not hang with one end free.

(b) Cable and jumper connections between locomotive may not have any of the following conditions:

- (1) Broken or badly chafed insulation.
- (2) Broken plugs, receptacles or terminals.
- (3) Broken or protruding strands of wire.

**§ 229.91 Motors and generators.**

A motor or a generator may not have any of the following conditions:

- (a) Be shorted or grounded.
- (b) Throw solder excessively.
- (c) Show evidence of coming apart.
- (d) Have an overheated support bearing.
- (e) Have an excessive accumulation of oil.

INTERNAL COMBUSTION EQUIPMENT

**§ 229.93 Safety cut-off device.**

The fuel line shall have a safety cut-off device that—

- (a) Is located adjacent to the fuel supply tank or in another safe location;
- (b) Closes automatically when tripped and can be reset without hazard; and
- (c) Can be hand operated from clearly marked locations, one inside the cab

**49 CFR Ch. II (10–1–13 Edition)**

and one on each exterior side of the locomotive.

**§ 229.95 Venting.**

Fuel tank vent pipes may not discharge on the roof nor on or between the rails.

**§ 229.97 Grounding fuel tanks.**

Fuel tanks and related piping shall be electrically grounded.

**§ 229.99 Safety hangers.**

Drive shafts shall have safety hangers.

**§ 229.101 Engines.**

(a) The temperature and pressure alarms, controls and related switches of internal combustion engines shall function properly.

(b) Whenever an engine has been shut down due to mechanical or other problems, a distinctive warning notice giving reason for the shut-down shall be conspicuously attached near the engine starting control until repairs have been made.

(c) Wheel slip/slide protection shall be provided on a locomotive with an engine displaying a warning notice whenever required by § 229.115(b).

STEAM GENERATORS

**§ 229.103 Safe working pressure; factor of safety.**

The safe working pressure for each steam generator shall be fixed by the chief mechanical officer of the carrier. The minimum factor of safety shall be four. The fixed safe working pressure shall be indicated on FRA Form F 6180–49A.

**§ 229.105 Steam generator number.**

An identification number shall be marked on the steam generator’s separator and that number entered on FRA Form F 6180–49A.

**§ 229.107 Pressure gauge.**

(a) Each steam generator shall have an illuminated steam gauge that correctly indicates the pressure. The steam pressure gauge shall be graduated to not less than one and one-half times the allowed working pressure of the steam generator.