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SAE J541 FEB89

**Voltage Drop for
Starting Motor
Circuits**

SAE Recommended Practice
Reaffirmed February 1989

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VOLTAGE DROP FOR STARTING MOTOR CIRCUITS

The starting motor circuits in motor vehicles, excluding motors, relays, and solenoids, shall be designed so that the difference between the voltage at the storage battery terminals and the starting motor terminals including connections shall not exceed those shown in Table 1. The voltage drop per hundred amps ($v_d/100_a$) is defined with a normal circuit temperature of 68°F (20°C). Since there is no finite division between "light and medium duty" and "heavy duty" applications, it is important that the engineer exercise judgment to make sure that the voltage drop selected does not have an adverse effect on the overall performance.

TABLE 1 - MAXIMUM VOLTAGE DROP

System Voltage	($v_d/100_a$)	Use
6V	0.12V	Light and Medium Duty
12V	0.200V	Light and Medium Duty
24V	0.400V	Light and Medium Duty
12V	0.10V	Heavy Duty
24V - 32	0.17V	Heavy Duty

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RATIONALE:

Not applicable.

RELATIONSHIP OF SAE STANDARD TO ISO STANDARD:

Not applicable.

REFERENCE SECTION:

Not applicable.

APPLICATION:

The starting motor circuits in motor vehicles, excluding motors, relays, and solenoids, shall be designed so that the difference between the voltage at the storage battery terminals and the starting motor terminals including connections shall not exceed those shown in Table 1.

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