

**SAE** The Engineering Society  
For Advancing Mobility  
Land Sea Air and Space®  
**INTERNATIONAL**  
400 Commonwealth Drive, Warrendale, PA 15096-0001

# SURFACE VEHICLE RECOMMENDED PRACTICE

SAE J1375

REV.  
MAR93Issued 1982-03  
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Superseding J1375 MAR82

Submitted for recognition as an American National Standard

## CRANKING MOTOR APPLICATION CONSIDERATIONS

**1. Scope**—This SAE Recommended Practice identifies some basic and general conditions that should be considered when making electrical cranking motor applications.

(R) **2. References**

**2.1 Applicable Documents**—The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply.

**2.1.1 SAE PUBLICATIONS**—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J541—Voltage Drop for Starting Motor Circuits

SAE J543—Starting Motor Pinions and Ring Gears

SAE J1253—Low Temperature Cranking Load Requirements of an Engine

**3. Application Conditions for Consideration**

(R) **3.1** Components for cranking motor system shall be selected according to the current edition of SAE J1253. A vehicle "owner's manual" recommended cranking cycle shall be limited to 15 s "on" followed by 2 min "off" for automotive gasoline engines. On diesel applications, allow a maximum of 30 s cranking time followed by 2 min "off."

**3.2** Pinion and ring gear data and center distances shall be compatible with the current edition of SAE J543.

**3.3** Maximum voltage drop in the battery cables shall not exceed limits shown in the current edition of SAE J541.

**3.4** Wire size versus length for the control circuit of magnetic switching devices shall be selected to insure proper design function.

**3.5** It is recommended that solenoid-actuated positive shift starting motors be mounted with the solenoid location at least 15 degrees above the horizontal center line.

**3.6** Engine rotation and mounting arrangements shall be known for fitting the cranking motor. System voltage shall be specified, and not exceeded.

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**3.7** Heat shields shall be provided as required to insure protection from damage to insulating materials and function of magnetic devices.

**3.8** All relevant environmental conditions including wet or dry transmission clutch construction shall be considered.

**4. Notes**

**4.1 Marginal Indicia**—The (R) is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. If the symbol is next to the report title, it indicates a complete revision of the report.

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