



AEROSPACE INFORMATION REPORT

AIR34™

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Superseding AIR34A

Penalties IN Performance of
Three-Phase, Four-Wire, 400-Cycle Motors Caused by the
Opening of One Phase

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

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INTRODUCTION

The aircraft motor manufacturers have expressed a need for a common understanding with users as to what performance can be expected when 400-cycle motors, not designed with this function in mind, are operated with one line open circuited on a three-phase, four-wire system. Consequently, a subcommittee, A-2M, Motors, operating under SAE Committee A-2, has reviewed the requirements and characteristics of 400-cycle aircraft type motors when operating under these conditions.

The power system and motor design parameters of 400-cycle motors are interrelated to such an extent that absolute recommendations as to load, speed, torque, and the effect on a particular system when operating with one phase open, could lead to serious difficulty if not thoroughly studied and applied.

Therefore, the A-2M Subcommittee, based on the enclosed informational data, advises that specification of "emergency two-phase operation" of a normal three-phase motor be rarely used. However, in those cases in which this type of operation is mandatory, the operational parameters should be clearly specified to permit proper design and engineering. Permissible reduction of performance should be included in these specifications in order to best adapt the motor to the application with the minimum size and weight penalty.

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