High-Temperature Switched-Reluctance Electric Motor

Motors like this one would be incorporated into gas turbines as starter/generators.

The High-Temperature Switched-Reluctance Electric Motor, capable of operating at a speed of 8,000 rpm at a temperature of 1,000 °F (≈540 °C), is a modified version of a magnetic bearing/motor operation has been demonstrated at room temperature but had not yet been demonstrated at high temperature at the time of reporting the information for this article.

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Inquiries concerning rights for the commercial use of this invention should be addressed to NASA Glenn Research Center, Commercial Technology Office, Attn: Steve Fedor, Mail Stop 4–8, 21000 Brookpark Road, Cleveland, Ohio 44135. Refer to LEW-17287.

System for Centering a Turbofan in a Nacelle During Tests

The system helps to maintain safety and accuracy.

A feedback position-control system has been developed for maintaining the concentricity of a turbofan with respect to a nacelle during acoustic and flow tests in a wind tunnel. The system is needed for the following reasons:
- Thermal and thrust loads can displace the fan relative to the nacelle;
- In the particular test apparatus (see Figure 1), denoted as a rotor-only nacelle (RAN), the struts, vanes, and other stator components of a turbofan engine that ordinarily maintain the required concentricity in the face of thermal and thrust loads are not present; and
- The struts and stator components are not present because it is necessary to provide a flow path that is acoustically "clean" in the sense that the measured noise can be attributed to the fan alone.

The system is depicted schematically in Figure 2. The nacelle is supported by two struts attached to a two-axis traverse table located outside the wind-tunnel wall. Two servomotors acting through 100:1 gearboxes drive the table along the Y and Z axes, which are perpendicular to the axis of rotation. The Y and Z components of the deviation from concentricity are measured by four laser displacement sensors mount-