Motor Fundamentals for Appliance Engineers Course Outline

Specifying issues such as performance, size, cost, efficiency, reliability, noise, environment and electronic controls.

I. Fundamental Concepts and Terminology

A. Electricity
B. Mechanics
C. Magnetism
D. Permanent Magnets
E. Steels
F. Electromagnetic Torque

II. Motor Construction

A. Configurations
B. Insulation
C. Bearings
D. Shafts

III. Motor Types

A. PMDC Brush Type

1. Permanent Magnet Field
2. Commutation
3. Performance
4. Thermal Properties
5. Velocity Profiles
6. Non-symmetrical Structures
G. Applications

B. Hollow Rotor PMDC Motor

C. Brushless PMDC Motor

1. Operation
2. Wye and Delta Connections
3. Thermal Considerations

D. Series Connected Wound Field Motor

1. Flux Plots

E. Shunt Connected Wound Field Motor

F. Compound Connected Wound Field Motor

G. Electromagnetic Interference

H. Step Motors

1.Variable Reluctance
2. Permanent Magnet
3. Hybrid
4. Performance

I. Switched Reluctance Motors

1.Performance

IV. Alternating Current Motors

A. Principle of Induction
B. Polyphase Induction Motors
C. Single Phase Motors
D. Split Phase Motors

1. Performance

E. Capacitor Start MotorMotors

1. Performance

F. Permanent Split Capacitor Motors

1. Performance

G. Shaded Pole Motors

1. Performance

V. Motor Noise

A. Permanent Magnet Motors
B. Switched Reluctance Motors
C. AC Induction Motors

VI. A Basic Discussion of Motor Control Systems

A. Speed Control
B. Pulse Width Modulation
C. Feedback Devices

VII. Summary

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Mr. Yeadon has over 40 years experience in the electric motor industry including work in design and development, production, quality assurance and engineering

management. Prior to starting his consulting firm in 1993, he worked at A.O. Smith, Warner Electric and Barber-Colman Co., Motor Div.