

1. Record Nr.	UNINA9910460810503321
Autore	Costa Gustavo K.
Titolo	Hydrostatic transmissions and actuators : operation, modelling and applications // Gustavo K. Costa, Nariman Sepehri
Pubbl/distr/stampa	Chichester, England : , : Wiley, , 2015 ©2015
ISBN	1-118-81889-X 1-118-81890-3
Descrizione fisica	1 online resource (406 p.)
Classificazione	TEC009070
Disciplina	620.1/06
Soggetti	Oil hydraulic machinery Fluid power technology Hydrostatics Power transmission Actuators Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Cover; Title Page; Copyright; Dedication; Contents; Preface; Acknowledgements; About the Companion Website; Chapter 1 Introduction to Power Transmission; 1.1 Transmission Ratio; 1.1.1 Generalities; 1.1.2 Definition; 1.1.3 Classification; 1.2 Mechanical Transmissions; 1.2.1 Gear Trains; 1.2.2 Gearboxes; 1.2.3 Efficiency; 1.2.4 Continuously and Infinitely Variable Transmissions; 1.3 Hydraulic Transmissions; 1.4 Hydrostatic Transmissions; 1.4.1 Operational Principles; 1.4.2 Formal Definition of Hydrostatic Transmissions; 1.4.3 Classification of Hydrostatic Transmissions 1.4.4 Efficiency Considerations 1.5 Hydromechanical Power-Split Transmissions; 1.5.1 General Classification; 1.5.2 Transmission Ratio; 1.5.3 Lockup Point; 1.5.4 Power Relations; 1.6 Mechanical and Hydrostatic Actuators; 1.6.1 Mechanical Actuators; 1.6.2 Hydrostatic Actuators; 1.6.3 Hydrostatic Actuation Versus Valve Control; 1.6.4 Multiple Cylinder Actuators; Exercises; References; Chapter 2

Fundamentals of Fluid Flows in Hydrostatic Transmissions; 2.1 Fluid Properties; 2.1.1 Viscosity; 2.1.2 Compressibility; 2.2 Fluid Flow in Hydraulic Circuits; 2.2.1 Flow Regimes  
2.2.2 Internal Flow in Conduits 2.2.3 Flow Through Orifices; 2.2.4 Leakage Flow in Pumps and Motors; 2.2.5 Other Loss Models; Exercises; References; Chapter 3 Hydrostatic Pumps and Motors; 3.1 Hydrostatic and Hydrodynamic Pumps and Motors; 3.2 Hydrostatic Machine Output; 3.2.1 Average Input-Output Relations; 3.2.2 Instantaneous Pump Output; 3.2.3 Instantaneous Motor Output; 3.2.4 Further Efficiency Considerations; 3.3 Hydrostatic Pump and Motor Types; 3.3.1 Radial Piston Pumps and Motors; 3.3.2 Axial Piston Pumps and Motors; 3.3.3 Gear Pumps and Motors; 3.3.4 Vane Pumps and Motors  
3.3.5 Digital Displacement Pumps and Motors 3.4 Energy Losses at Steady-State Operation; 3.4.1 Energy Balances; 3.4.2 Overall Efficiencies; 3.4.3 Simplified Efficiency Equations; 3.4.4 Efficiency Relations; 3.5 Modelling Pump and Motor Efficiencies; 3.5.1 Performance Curves; 3.5.2 Volumetric Efficiency Modelling; 3.5.3 Overall Efficiency Modelling; 3.5.4 Mechanical Efficiency; Exercises; References; Chapter 4 Basic Hydrostatic Transmission Design; 4.1 General Considerations; 4.1.1 Output Speed Control; 4.1.2 Transmission Losses; 4.2 Hydrostatic Transmission Efficiency; 4.2.1 Energy Balance  
4.2.2 Conduit Efficiency 4.2.3 Minor Pressure Losses; 4.2.4 Practical Application; 4.3 Transmission Output; 4.4 Steady-State Design Applications; 4.4.1 Case Study 1. Fixed-Displacement Motor and Variable-Displacement Pump; 4.4.2 Case Study 2. Fixed-Displacement Pump and Variable-Displacement Motor; 4.5 External Leakages and Charge Circuit; 4.6 Heat Losses and Cooling; 4.6.1 Sizing of the Heat Exchanger; 4.6.2 Loop Flushing; Exercises; References; Chapter 5 Dynamic Analysis of Hydrostatic Transmissions; 5.1 Introduction; 5.1.1 Pressure Surges during Transients  
5.1.2 Mechanical Vibrations and Noise

---

## Sommario/riassunto

"Hydrostatic Transmissions and Actuators takes a pedagogical approach and begins with an overview of the subject, providing basic definitions and introducing fundamental concepts. Hydrostatic transmissions and hydrostatic actuators are then examined in more detail with coverage of pumps and motors, hydrostatic solutions to single-rod actuators, energy management and efficiency and dynamic response. Consideration is also given to current and emerging applications of hydrostatic transmissions and actuators in automobiles, mobile equipment, wind turbines, wave energy harvesting and airplanes. End of chapter exercises and real world industrial examples are included throughout and a companion website hosting a solution manual is also available. Hydrostatic Transmissions and Actuators is an up to date and comprehensive textbook suitable for courses on fluid power systems and technology, and mechatronics systems design"--

---