

# **Table of contents – vol. 1**

**ABOUT THE AUTHORS**

**FOREWORD**

**PREFACE**

**ACKNOWLEDGMENTS**

**LIST OF SYMBOLS**

## **I WHEELS, STRUCTURES AND MECHANISMS**

### **INTRODUCTION TO PART I**

#### **1 HISTORICAL EVOLUTION**

- 1.1 Introduction
- 1.2 Rigid axle mechanical linkages
- 1.3 The independent suspension mechanical linkages
- 1.4 Wheels and tires
- 1.5 Brakes
- 1.6 Chassis frame

#### **2 WHEELS AND TIRES**

- 2.1 Description
- 2.2 Tire operation
- 2.3 Rolling radius
- 2.4 Rolling resistance
- 2.5 Static Forces
- 2.6 Longitudinal Force
- 2.7 Cornering forces
- 2.8 Interaction between longitudinal
- 2.9 Outline on dynamic behavior
- 2.10 Testing

#### **3 SUSPENSIONS**

- 3.1 Introduction
- 3.2 Independent suspensions
- 3.3 Semi-independent suspensions
- 3.4 Rigid axle suspensions
- 3.5 Industrial vehicle suspensions
- 3.6 Design and testing

#### **4 STEERING SYSTEM**

- 4.1 Introduction
- 4.2 Steering mechanism
- 4.3 Rack and pinion steering box
- 4.4 Screw and sector steering box
- 4.5 Steering column
- 4.6 Power steering
- 4.7 Design and testing

## **5 BRAKING SYSTEM**

- 5.1 Introduction
- 5.2 Car brakes
- 5.3 Industrial vehicle brakes
- 5.4 Design and testing

## **6 CONTROL SYSTEMS**

- 6.1 Steering control
- 6.2 Brake control
- 6.3 Suspension control

## **7 CHASSIS STRUCTURES**

- 7.1 Underbody
- 7.2 Subframe
- 7.3 Industrial vehicle frames
- 7.4 Structural tasks and side forces
- 7.5 Structural design
- 7.6 Structural testing

## **II TRANSMISSION DRIVELINE**

### **INTRODUCTION TO PART II**

## **8 HISTORICAL EVOLUTION**

- 8.1 Manual gearbox
- 8.2 Friction clutches
- 8.3 Automatic gearboxes

## **9 MANUAL GEARBOXES**

- 9.1 Manual gearbox classification
- 9.2 Mechanical efficiency
- 9.3 Manual automobile gearboxes
- 9.4 Manual gearboxes for industrial vehicles

## **10 SHIFTING MECHANISMS**

- 10.1 Internal shifting mechanisms
- 10.2 External shifting mechanisms

## **11 START-UP DEVICES**

- 11.1 Friction clutch
- 11.2 Start-up devices for automatic gearboxes.

## **12 SYNCHRONIZERS**

- 12.1 Description
- 12.2 Design criteria

## **13 DIFFERENTIALS AND FINAL DRIVES**

- 13.1 Differentials and final drives
- 13.2 All wheel drive transfer boxes
- 13.3 Outline of differential theory
- 13.4 Types of self-locking differentials
- 13.5 Differential effect on vehicle dynamics

## **14 SHAFTS AND JOINTS**

- 14.1 Propeller shafts
- 14.2 Half shafts
- 14.3 Universal joints
- 14.4 Constant speed joints

## **15 AUTOMATIC GEARBOXES**

- 15.1 General issues
- 15.2 Car gearboxes with fixed rotation axis
- 15.3 Epicycloidal car gearboxes
- 15.4 Car CVTs
- 15.5 Gearboxes for industrial vehicles
- 15.6 Control strategies

## **16 DESIGN AND TESTING**

- 16.1 Transmission mission
- 16.2 Gears
- 16.3 Shafts
- 16.4 Bearings
- 16.5 Lubricants
- 16.6 Housings and seals
- 16.7 Outline of test technologies

## **REFERENCES OF VOLUME I**

## **INDEX**