Preface to the second edition
Preface to the first edition

1 Vehicle structure
• Integral body structure
• Engine, transmission and body structure mountings
• Fifth wheel coupling assembly
• Trailer and caravan drawbar couplings
• Semi-trailer landing gear
• Automatic chassis lubrication system

2 Friction clutch
• Clutch fundamentals
• Angular driven plate cushioning and torsional damping
• Clutch friction materials
• Clutch drive and driven member inspection
• Clutch misalignment
• Pull type diaphragm clutch
• Multiplate diaphragm type clutch
• Lipe rollway twin driven plate clutch
• Spicer twin driven plate angle spring pull type clutch
• Clutch (upshift) brake
• Multiplate hydraulically operated automatic transmission clutches
• Semicentrifugal clutch
• Fully automatic centrifugal clutch
• Clutch pedal actuating mechanisms
• Composite flywheel and integral single plate diaphragm clutch

5 Semi- and fully automatic transmission
• Automatic transmission consideration
• Four speed and reverse longitudinally mounted automatic transmission mechanical power flow
• The fundamentals of a hydraulic control system
• Basic principle of a hydraulically controlled gearshift
• Basic four speed hydraulic control system
• Three speed and reverse transaxle automatic transmission mechanical power flow
• Hydraulic gear selection control components
• Hydraulic gear selection control operation
• The continuously variable belt and pulley transmission
• Five speed automatic transmission with electronic-hydraulic control
• Semi-automatic (manual gear change two pedal control) transmission system

3 Manual gearboxes and overdrives
• The necessity for a gearbox
• Five speed and reverse synchronmesh gearboxes
• Gear synchronization and engagement
• Remote controlled gear selection and engagement mechanisms
• Splitter and range change gearboxes
• Transfer box power take-off (PTO)
• Overdrive considerations
• Setting gear ratios

4 Hydrokinetic fluid couplings and torque converters
• Hydrokinetic fluid couplings
• Hydrokinetic fluid coupling efficiency and torque capacity
• Fluid friction coupling
• Hydrokinetic three element torque converter
• Torque converter performance terminology
• Overrun clutches
• Three stage hydrokinetic torque converter
• Polyphase hydrokinetic torque converter
• Torque converter with lock-up and gear change friction clutches

6 Transmission bearings and constant velocity joints
• Rolling contact bearings
• The need for constant velocity joints

7 Final drive transmission
• Crownwheel and pinion axle adjustments
• Differential locks
• Skid reducing differentials
• Double reduction axles
• Two speed axles
• The third (central) differential
Advanced Vehicle Technology
Second Edition

- Four wheel drive arrangements
- Electro/hydraulic limited slip differential
- Tyre grip when braking and accelerating with good and poor road surfaces
- Traction control system

8 Tyres
- Ttractive and braking properties of tyres
- Tyre materials
- Tyre tread design
- Cornering properties of tyres
- Vehicle steady state directional stability
- Tyre marking identification
- Wheel balancing

9 Steering
- Steering gearbox fundamental design
- The need for power assisted steering
- Steering linkage ball and socket joints
- Steering geometry and wheel alignment
- Variable-ratio rack and pinion
- Speed sensitive rack and pinion power assisted steering
- Rack and pinion electric power assisted steering

10 Suspension
- Suspension geometry
- Suspension roll centres
- Body roll stability analysis
- Anti-roll bars and roll stiffness
- Rubber spring bump or limiting stops
- Axle location
- Rear suspension arrangements
- Suspension design consideration
- Hydrogen suspension
- Hydropneumatic automatic height correction suspension (Citroen)
- Commercial vehicle axle beam location
- Variable rate leaf suspension springs
- Tandem and tri-axle bogies
- Rubber spring suspension
- Air suspensions for commercial vehicles
- Lift axle tandem or tri-axle suspension
- Active suspension
- Electronic controlled pneumatic (air) suspension for on and off road use

11 Brake system
- Braking fundamentals

- Brake shoe and pad fundamentals
- Brake shoe expanders and adjusters
- Disc brake pad support arrangements
- Dual- or split-line braking systems
- Apportioned braking
- Anti-locking brake system (ABS)
- Brake servos
- Pneumatic operated disc brakes (for trucks and trailers)

12 Air operated power brake equipment and vehicle retarders
- Introduction to air powered brakes
- Air operated power brake systems
- Air operated power brake equipment
- Vehicle retarders
- Electronic-pneumatic brakes

13 Vehicle refrigeration
- Refrigeration terms
- Principles of a vapour–compression cycle refrigeration system
- Refrigeration system components
- Vapour–compression cycle refrigeration system with reverse cycle defrosting

14 Vehicle body aerodynamics
- Viscous air flow fundamentals
- Aerodynamic drag
- Aerodynamic lift
- Car body drag reduction
- Aerodynamic lift control
- Afterbody drag
- Commercial vehicle aerodynamic fundamentals
- Commercial vehicle drag reducing devices

Index