



Training
Systems
Australia

Automotive Digital Library



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Automotive Digital Library: Courses

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LIB 3: 34 Engine Repair

Cylinder Head and Valve Trains

- Camshafts and Valve Lifters
- Components of the Top End
- Engine Cycles, Valve and Ignition Timing

Engine Block

- Bottom End Component Identification
- CI Engine Size
- Components of the Bottom End
- Crankshaft and Piston Operation
- Engine Blocks and Liners
- Engine Size
- Pistons
- Pressure and Volume

Engine Fundamentals

- Common Rail Diesel Engine Component Identification
- Common Rail Diesel Engine Operation
- Four Stroke Cycle
- Front End Component Identification
- Introduction to Engine Systems
- Position and Mounting of Engine Components
- Sectioned (CI) Engine Component Identification

Engine Servicing

- Adjustment of Valve Clearances on an OHC Engine
- Basic Engine Service Procedures
- Camshaft Timing Verification
- Cooling System Inspection, Test and Repair
- Cylinder Compression Test
- Cylinder Leakage Test
- Cylinder Power Balance Test
- Engine Removal and Replacement
- Inspect and Repair Threads
- Manifold Vacuum Test

Lubrication and Cooling Systems

- Adjusting Drive Belt Tension
- Cooling Systems
- Engine Oil Pressure
- Lubrication System Inspection
- Lubrication Systems

Automotive

LIB 3: 35 Automatic Transmission and Transaxle

Automatic Transmission Components

- Automatic Transmission Gears
- Electrical and Electronic Controls
- Gears and Planetary Gear Sets
- Planetary Gears, Clutches, and Bands

Automatic Transmission Servicing

- Automatic Transmission Diagnostic Checks

Final Drives

- Drivetrain and Driveline
- Front Wheel Final Drive Systems
- Locating Driveline Components
- Rear Wheel Final Drive Systems

Transmission System Fundamentals

- Automatic Transmission Operation
- Automatic Transmission Systems
- Introduction to Automatic Transmissions

LIB 3: 36 Manual Drive Train and Axles

Manual Transmission and Driveline Servicing

- Clutch Removal, Inspection, and Refitting
- Clutch System - Symptoms and Faults
- Drive Shaft Servicing Procedures
- Inspecting FWD Shafts and Joints
- Inspecting the Complete Transmission System of a Vehicle

Manual Transmission Components and Operation

- Clutch Construction and Operation
- Clutch Design
- Differential
- Front Wheel Drive Shafts
- Gears and Speed
- Manual Transaxles
- Manual Transmission Construction
- Rear Wheel Drive Shafts
- Selector Lever and Selector Forks

Manual Transmission System Fundamentals

- Clutch and Manual Transmission Systems
- Gears and Gear Ratios
- Manual Transmission Introduction
- Manual Transmissions

Automotive

LIB 3: 37 Suspension

Inspection and Repair

- Geometry Adjustments
- How to Check Shock Absorbers for Leaks
- Inspect, Remove, and Replace Shock Absorbers
- Leaf Spring Removal, Inspection, and Reinstallation Procedures
- MacPherson Strut Coil Spring Removal and Inspection
- MacPherson Strut Removal, Inspection, and Reinstallation Procedures
- Removal, Inspection and Installation of Coils Springs and Insulators
- Remove, Inspect and Install Ball Joints on Suspension Systems
- Remove, Inspect and Install Stabilizer Bushings, Brackets and Links
- Remove, Inspect, and Install Transverse Links and Strut Rods
- Remove, Inspect, and Install Upper and Lower Control Arms
- Remove, Inspect, Install and Adjust Torsion Bars
- Remove, Inspect, Install, and Adjust Strut Rods and Bushings

Suspension Components and Operation

- Coil Springs
- Control Arms
- Leaf and Rubber Springs
- MacPherson Struts

Suspension System Fundamentals

- Geometry Fundamentals

LIB 3: 38 Steering

Inspection and Repair

- Adjusting Wheel Height
- Adjustment of Steering Box Pre-Load
- Check and Top-Up Power Steering Fluid
- Check Front Cradle (Subframe) Alignment
- Check Power Steering System
- Diagnose Power Steering Problems
- Flushing and Bleeding the Power Steering System
- Rack and Pinion Gear Service
- Remove and Inspect Conventional Steering Components
- Remove, Inspect, and Replace Conventional Steering Components
- Removing Rack and Pinion Steering Gear

Steering System Components and Operation

- Conventional Steering System Components
- Electronic Steering Systems
- Introduction to the Steering and Suspension Trainer
- Power Steering Systems

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Wheel and Tire Servicing

- Balance Wheel and Tire Assembly
- Caster, Camber, Toe, and Setback Checks and Adjustment
- Check Steering Axis Inclination and Toe-out on Turns
- Measure Wheel, Tire, Axle and Hub Runout
- Perform Prealignment Inspection
- Road Wheel Removal and Installation
- Sealed Wheel Bearing Replacement Procedure

Wheels and Tires

- Road Wheels

LIB 3: 39 Brake Systems

Advanced Brake Systems

- Diagnosing Faults in ESP Systems
- Electronic Brake Systems Introduction

Anti-lock Braking Systems

- ABS Braking Cycle
- ABS ECU Circuits and Signals
- ABS Relay
- ABS Warning Lamp and Diode
- Anti-Lock Brake Systems
- Anti-Lock Brake Trainer
- Brake Fluid Level Switch
- Brake Pedal Switch
- Brake Pedal Travel Sensor
- Hall Effect Sensor Investigation
- Hydraulic Control Unit
- Hydraulic Pump and Motor
- Hydraulic Pump Motor Speed Sensor
- Inductive Sensor Investigation
- Sensors and Switches

Brake System Fundamentals

- Brake Systems 1
- Brake Systems 2
- Friction

Hydraulic Control

- Basic Fluid Power Engineering
- Fluid Power Concepts

Warning Systems

- Brake Fluid Warning System
- Brake Warning Systems

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LIB 3: 40 Brake Components

Brake System Fundamentals

- Introduction to the Brake Systems Trainer

Disc Brakes

- Brake Callipers
- Brake Pads
- Brake Rotors
- Integral Calliper Parking Brake

Drum Brakes

- Brake Drums
- Brake Shoes
- Parking Brakes

Hydraulic Control

- Basic Control Valves
- Brake Fluid
- Brake Lines and Hoses
- Hydraulics
- Pressure Control Valves

Power Assistance

- Hydraulic Brake Boosters

LIB 3: 41 Brake Servicing

Brake Line Servicing

- Brake Line Fabrication
- Brake Line Inspection
- Fabricating Brake Lines

Brake System Fundamentals

- Braking Calculations
- Braking Forces

Brake System Servicing

- ABS Servicing Procedure
- Bleed Brake System (Manual Bleed)
- Bleeding a Pressurized Anti-lock Braking System
- Brake Pedal Height
- Checking Pedal Heights and Adjusting Push Rod Length
- De-pressurize High-pressure Components of the Anti-lock Brake System
- Flush Brake System
- Master Cylinder Inspection
- Master Cylinder Removal, Bench Bleed, and Reinstall
- Parking Brake Cable Replacement
- Replacing ABS Component Procedure

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Disc Brake System Servicing

- Brake Calliper Inspection
- Brake Pad Removal and Brake Assembly Inspection
- Brake Pad Replacement
- Brake Pad Wear Indicator Inspection
- Brake Rotor Replacement
- Integral Calliper Parking Brake Service
- Machining a Rotor
- Measuring Brake Rotors

Drum Brake System Servicing

- Adjusting the Parking Brake
- Brake Shoe Replacement
- Drum Brake Removal and Inspection
- Drum Brake Removal, Disassembly and Inspection
- Machining a Drum

LIB 3: 42 Automotive Electrical Fundamentals

Electrical Components and Operation

- Capacitor Types and Applications
- Diode Types and Applications
- Relays
- Sensors
- Signal Processing

Electrical Fundamentals

- Changeover Switches
- Circuit Faults
- Common Ground Circuits
- Common Ground Circuits and Wiring Diagrams
- Continuity
- Continuity and Circuit Faults
- Control Examples
- Control Principles
- Controlling and Protecting Simple Circuits
- Current Flow in a Simple Circuit
- DC and AC Current
- Electrical Circuits
- Electrical Safety and Circuit Checks
- Electricity
- Electromagnetic Principles
- Information Flow
- Introduction to Wiring Diagrams
- Ohm's Law
- Physical Environment to Electrical Transformation
- Power

Automotive

- Pushbutton Switches
- Pushbutton Switches and Switch Circuits
- Resistance
- Resistance and Ohm's Law
- Simple Battery and Lamp Circuit
- Simple Battery, Lamp, and Switch Circuit
- Simple Battery, Lamp, Switch and Fuse Circuit
- Simple Circuits

Electrical Measurement

- Calculating and Adjusting Permitted Voltage Drop
- Electrical Circuit Testing
- Electrical Test Equipment
- Measuring Current
- Reading Wiring Diagrams

Electrical Supply

- Batteries
- Battery and Fuse Circuit Fault Investigation 1
- Battery and Fuse Circuit Fault Investigation 2
- Battery and Fuse Investigation

LIB 3: 43 Automotive Starting and Charging

Charging System Fundamentals

- Alternator Construction
- Charging Principles
- Charging Systems
- Magnetism and Electromagnetism

Charging System Inspection and Test

- Alternator Fault Investigation 1
- Alternator Fault Investigation 2
- Alternator Output Tests
- Alternator Output Waveforms
- Alternator Service Procedure
- Charging System Fault Diagnosis
- Replacing an Alternator and Drive Belt
- Performing Voltage Drop and Current Draw Tests

LIB 3: 44 Automotive Lighting

Hazard Warning Lighting Circuit

- Hazard Warning Circuit
- Hazard Warning Lamps

Automotive

Headlight Circuits

- Automatic Lighting
- Four-Pin Relay Headlamp Circuit
- Headlamp Flash Circuit
- Headlamps
- Headlamps 1
- Headlamps 2
- Headlights
- High Beam Flash Circuit
- Low and High Beam Circuits
- Relay and Spot Lamp Circuit

Internal Lighting Circuits

- Internal Lamp Circuit Investigation
- Internal Lamp Circuits
- Internal Lighting

Lighting Circuit Fault Diagnosis

- Backup Lamp Circuit Fault
- Fault-Finding Example
- Four Pin Relay Headlamp Circuit Problem Solving
- Hazard Warning Circuit Fault
- Headlamp Lighting Fault 1
- Headlamp Lighting Fault 2
- Headlamp Lighting Fault 3
- High Beam Flash Circuit Fault
- Interior Lamp Circuit Fault
- Introduction to Fault-Finding
- Lighting Circuit Fault Investigation 1
- Lighting Circuit Fault Investigation 2
- Lighting Circuit Fault Investigation 3
- Lighting Fault Diagnosis
- Lighting Systems Fault Diagnosis 1
- Lighting Systems Fault Diagnosis 2
- Lighting Systems Fault Diagnosis 3
- Low and High Beam Circuit Fault
- Park and Tail Lamp Circuit Fault
- Park and Tail Lighting Fault
- Park, Tail, and Headlamp Circuit Fault 1
- Park, Tail, and Headlamp Circuit Fault 2
- Park, Tail, and Headlamp Circuit Problem Solving

Lighting Circuit Fundamentals

- Identical Lamps in Parallel
- Identical Lamps in Series
- Lighting Systems
- Non-Identical Lamps in Parallel
- Non-Identical Lamps in Series
- Parallel Lamp Circuits

Automotive

- Power in a Simple Lamp Circuit
- Series Lamp Circuits

Park and Tail Light Circuits

- Park and Tail Lamp Circuits
- Park and Tail Lighting
- Park and Tail Lights
- Park, Tail, and Headlamp Circuits 1
- Park, Tail, and Headlamp Circuits 2

Stop and Backup Light Circuits

- Backup Lamp Circuit Investigation

LIB 3: 45 Automotive Transducers

Transducer Circuits and Components

- Air Flow Sensor
- Coolant Temperature Sensor
- Crankshaft Position Sensor
- Engine Coolant Temperature Sensor
- Intake Air Temperature Sensor
- Mass Airflow Sensor
- Oxygen Sensor
- Performing a Gauge Circuit Test

Transducer Fault Diagnosis

- Fault Investigation 1
- Fault Investigation 2
- Fault Investigation 4

LIB 3: 46 Ignition Systems

Distributor Electronic Ignition Systems

- Hall Effect Electronic Ignition Systems
- Inductive Reluctance Electronic Ignition Systems
- DIS Trainer Crankshaft Sensor
- DIS Trainer Features
- DIS Trainer Operation
- DIS Trainer Temperature Sensor
- DIS Trainer Waveforms
- Distributorless Ignition Systems

Ignition System Diagnosis

- Extremely Rough Idle Problem 1
- Extremely Rough Idle Problem 2
- Lack of Power Problem

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- No Start Problem 1
- No Start Problem 2
- No Start Problem 3

Ignition System Fundamentals

- Breaker Point Ignition Systems
- Ignition Coil Investigation
- Introduction to Ignition Systems

Ignition System Servicing

- Distributor Testing
- Ignition Secondary Circuit Inspection
- Ignition System Wavepattern Investigation
- Ignition Timing Check and Adjustment
- Inspection and Testing of an Ignition Coil
- Inspection and Testing of the Ignition Primary Circuit

LIB 3: 47 Engine Management and Control

Actuators

- Actuator Components

Engine Inspection

- Coolant Servicing
- Evaporative Emissions Control Systems - Inspection and Test
- Positive Crankcase Ventilation System - Inspection and Test
- Pulse Air Injection System - Inspection and Test
- Retrieval and Clearing of OBD I Trouble codes
- Retrieval and Clearing of OBD II Trouble codes

Engine Management Fault Investigation

- Diesel Engine Fault Diagnosis
- Engine Fault Diagnosis 1
- Engine Fault Diagnosis 10
- Engine Fault Diagnosis 2
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- Engine Fault Diagnosis 4
- Engine Fault Diagnosis 5
- Engine Fault Diagnosis 6
- Engine Fault Diagnosis 7
- Engine Fault Diagnosis 8
- Engine Fault Diagnosis 9
- Engine Management System Fault Diagnosis
- Fault Investigation 5
- Fault Investigation 6

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Engine Management System Fundamentals

- Air Management in a Diesel Engine
- Decision Making Processes
- Electronic Control Unit
- Engine Management System
- Engine Management System Fundamentals
- Fuel Injection System Decisions
- Ignition System Decisions
- On Board Diagnostics Two (OBDII) Systems

Sensors

- Engine Coolant Temperature
- Engine Sensor Fault Diagnosis 1
- Engine Sensor Fault Diagnosis 2
- Sensor Components
- Sensors and Actuators

LIB 3: 48 Fuel and Emissions

Air Induction Components and Operation

- Air Management
- Idle Air Control Valve
- Sensor Circuits and Components

Diesel Engine Management

- Common Rail Diesel Engine
- Exhaust Management System
- Fuel in a Diesel Engine
- Fuel Injection Management in a Diesel Engine

Emission Control Systems

- Air Injection Systems
- Catalytic Converter
- Exhaust Emission Control Components
- Exhaust Gas Recirculation Systems

Fuel and Emissions System Servicing

- Catalytic Converter Inspection and Efficiency Testing
- Checking the Operation of Solenoid Operated Fuel Injectors
- Cold Enrichment System Inspection and Test
- Early Exhaust Recirculation System - Inspection and Test
- EFI Demonstrator Fault Diagnosis 1
- EFI Demonstrator Fault Diagnosis 10
- EFI Demonstrator Fault Diagnosis 2
- EFI Demonstrator Fault Diagnosis 3
- EFI Demonstrator Fault Diagnosis 4
- EFI Demonstrator Fault Diagnosis 5
- EFI Demonstrator Fault Diagnosis 6

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- EFI Demonstrator Fault Diagnosis 7
- EFI Demonstrator Fault Diagnosis 8
- EFI Demonstrator Fault Diagnosis 9
- Exhaust Gas Analyser
- Exhaust System Inspection and Testing
- Fuel Filter Inspection
- Fuel Injection System Fault Diagnosis
- Fuel Injector - Inspection, Testing, and Cleaning
- Fuel Pressure on an Electronic Fuel Injection System
- Fuel Pump Inspection & Pressure Testing
- Fuel System Inspection
- Fuel Trim and Exhaust Emissions Monitoring
- Idle Speed and Fuel Mixture Adjustment
- Inspecting and Draining a Fuel System
- Intake Air System Inspection
- Investigation of Exhaust Emission Levels
- Mixture Control Solenoid Duty Cycle Investigation

Fuel Components and Operation

- Actuator Circuits and Components
- EFI Fuel Injector Pulse Frequency
- EFI Fuel Injector Pulse Timing
- EFI Fuel Injector Pulse Width
- EFI Pressurized Fuel Systems
- Electric Fuel Pump
- Electronic Multipoint Fuel Injection Systems
- Fuel Injection Components
- Fuel Injection Fundamentals
- Fuel Injector Pulse Frequency
- Fuel Injector Pulse Timing
- Fuel Injector Pulse Width
- Fuel Injectors
- Introduction to the EFI Demonstrator
- Pressurized Fuel Systems

LIB 3: 49 Electric and Hybrid Vehicle Technology

Electric Vehicles

- Definition of Electric Vehicles
- Electric Motors
- Features of Electric Vehicles
- Fuel Cells
- Range Extenders

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High Voltage Electric Vehicles

- High Voltage Vehicles
- High Voltage Wiring and Connectors
- Legal Regulations
- Lithium-ion Batteries
- NiMH Batteries
- Principles of Lithium-ion Batteries
- Principles of NiMH Batteries
- Qualifications for Working on High Voltage Vehicles
- Reasons for the Development of High Voltage Vehicles
- Safety in High Voltage Vehicles
- Safety with Batteries

Hybrid and Electric Vehicle Systems

- AC Motors and Generators
- Battery Packs
- Brake Systems
- Cables and Connectors
- Cables, Connectors and Protection Devices
- Disabling Hybrid Vehicle Systems
- Disabling the High Voltage System
- Electronic Circuits and Modules
- Fuel and Emissions
- Hybrid Electric Motors
- Hybrid Engines
- Hybrid Safety Issues and Concerns
- Hybrid Vehicle Trainer Controls
- Introduction to Electrical Storage Devices
- Introduction to Hybrid and Electric Vehicles
- Introduction to the Hybrid Vehicle Trainer
- Lead Acid Batteries
- Nickel Metal Hydride Batteries
- Parallel Hybrid Systems
- Plug-in Electric Vehicles
- Plug-in Hybrid Vehicles
- Practical Series Parallel Hybrid Systems
- Series Hybrid Systems
- Series Parallel Hybrid Systems and Components
- Series Parallel Systems and Components

Hybrid Vehicles

- Classification of Hybrid Vehicles by Engine Arrangement
- Classification of Hybrid Vehicles by Power Source
- Diagnose Equipotential Faults
- Diagnose Insulation Measurement Faults
- Features of Hybrid Vehicles

Automotive

LIB 3: 50 Networked Systems

Networked Systems Data

- CAN Bus Data Processing
- CAN Bus Fault Diagnosis
- CAN Bus Fault Diagnosis - 2
- CAN Bus Fault Diagnosis - 3
- CAN Bus Fault Diagnosis - 4
- CAN Bus Fault Diagnosis - 5
- CAN Bus Fault Diagnosis - 6
- CAN Signal Response

LIB 3: 51 CAN Bus Lighting Systems

Lighting Systems Diagnosis

- CAN Bus Lighting Control Fault 1
- CAN Bus Lighting Control Fault 2
- CAN Bus Lighting Fault 1
- CAN Bus Lighting Fault 2
- CAN Bus Lighting Fault 3
- CAN Bus Lighting Fault 4
- CAN Bus Lighting Fault 5
- CAN Bus Lighting Fault 6
- CAN Bus Lighting Fault 7
- CAN Bus Lighting Fault 8
- CAN Bus Lighting Faults

Lighting Systems Measurement

- CAN Bus Fog Light System Measurement
- CAN Bus Headlight System Measurement
- CAN Bus Lighting Systems Measurement
- CAN Bus Park and Tail Light System Measurement
- CAN Bus Stop and Backup Light System Measurement
- CAN Bus Turn Signal and Hazard Warning System Measurement

Lighting Systems Operation

- CAN Bus Fog Light Systems
- CAN Bus Lighting Control
- CAN Bus Lighting Systems
- CAN Bus Park, Tail, and Headlight Systems
- CAN Bus Stop and Backup Light Systems
- CAN Bus Turn Signal and Hazard Warning Systems

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LIB 3: 52 CAN Bus Auxiliary Systems

Auxiliary Systems Diagnosis

- Auxiliary CAN Bus Fault Tolerance
- CAN Bus Auxiliary Fault 1
- CAN Bus Auxiliary Fault 2
- CAN Bus Auxiliary Fault 3
- CAN Bus Auxiliary Fault 4
- CAN Bus Auxiliary Fault 5
- CAN Bus Auxiliary Fault 6
- CAN Bus Auxiliary Fault 7
- CAN Bus Auxiliary Faults
- Faults in Auxiliary CAN Bus Systems
- Open Circuit Auxiliary CAN Bus Faults
- Short Circuit Auxiliary CAN Bus Faults

Auxiliary Systems Measurement

- Analyser Tests on an Auxiliary CAN Bus System
- CAN Bus Mirror System Measurement
- CAN Bus Power Door Locking System Measurement
- CAN Bus Seat System Measurement
- CAN Bus Window System Measurement
- CAN Bus Window, Mirror, and Seat Systems Measurement
- CAN Data Bus Measurement
- Multimeter Tests on an Auxiliary CAN Bus System
- Oscilloscope Tests on an Auxiliary CAN Bus System

Auxiliary Systems Operation

- Auxiliary CAN Bus Door Mirror Control Systems
- Auxiliary CAN Bus Safety Systems
- Auxiliary CAN Bus Security Systems
- Auxiliary CAN Bus Systems
- Auxiliary CAN Bus Window Control Systems
- CAN Bus Power Door Locking System
- CAN Bus Window, Mirror, and Seat Systems
- Effect of a Disconnected CAN Bus Control Module

LIB 3: 53 CAN Bus Starting and Charging Systems

Starting and Charging Systems Diagnosis

- CAN Bus Starting and Charging Fault 1
- CAN Bus Starting and Charging Fault 2
- CAN Bus Starting and Charging Fault 3
- CAN Bus Starting and Charging Fault 4
- CAN Bus Starting and Charging Fault 5
- CAN Bus Starting and Charging Fault 6
- CAN Bus Starting and Charging Fault 7
- CAN Bus Starting and Charging Fault 8

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- CAN Bus Starting and Charging Faults

Starting and Charging Systems Measurement

- Automatic Stop-Start System Measurement
- CAN Bus Advanced Starting and Charging System Measurement
- CAN Bus Conventional Charging System Measurement
- CAN Bus Conventional Starting System Measurement
- CAN Bus Power Consumers Measurement
- CAN Bus Starting and Charging Systems Measurement

Starting and Charging Systems Operation

- Automatic Stop-Start System
- CAN Bus Advanced Starting and Charging System
- CAN Bus Conventional Starting and Charging System
- CAN Bus Starting and Charging Systems

LIB 3: 54 Automotive Heating and Air Conditioning

Heating and Air Conditioning Fundamentals

- Air Conditioning Principles
- Air Conditioning Systems
- Air Conditioning Trainer
- Air Conditioning Trainer Operation
- Refrigerant Leak Detection
- Refrigeration Cycle

HVAC Components and Operation

- A/C Electrical System Fault Investigation
- Air Distribution Control System Investigation
- Air Distribution Control System Troubleshooting 1
- Air Distribution Control System Troubleshooting 2
- Air Distribution Control System Troubleshooting 3
- Blower Motor Fault Investigation 1
- Blower Motor Fault Investigation 2
- Climate Control System Operation
- Compressor Fault Investigation
- Compressors
- Condensers
- HVAC Electrical Controls Investigation
- Lines and Hoses

HVAC Servicing

- A/C Compressor Clutch Removal
- A/C System Troubleshooting 1
- A/C System Troubleshooting 2
- Air Conditioning Practical
- Air Conditioning System Performance Test
- Airflow Restrictions and Components

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- Control Head and Component Servicing
- Cooling System Inspection
- Discharging and Recharging an A/C System
- Duratec Engine Air-conditioning System Servicing
- Filter Inspection and Installation
- FOTCC System Troubleshooting
- Heater and Air Management Service Procedure
- Inspect Airflow Components on a Workshop Vehicle
- Inspection and Testing of Airflow Components
- Inspection of A/C Evaporator Drain
- Investigation of a FOTCC System
- Removal, Inspection, and Replacement of A/C Compressor Clutch
- Remove, Inspect, and Install A/C System Hose and Fittings
- Removing and Replacing the A/C Compressor
- Replacement and Inspection of Accumulator/Receiver-drier
- Servicing the FOT and TXV

LIB 3: 55 Auto Shop

Automotive Technology

- Automotive Terminology

Preparing Vehicle for Service

- Door Panel Removal and Replacement
- Logical Fault Diagnosis
- Repair Orders

Shop and Personal Safety

- Fire Fighting
- Fire Safety Equipment
- First Aid 1
- First Aid 2
- High Voltage Circuits
- Marked Safety Areas and Evacuation Routes
- Material Safety Data Sheets
- Personal Protective Equipment
- Personal Protective Equipment 1
- Rules and Procedures
- Rules and Procedures 1

Tools and Equipment

- Handling Tools and Equipment
- Lifting Equipment
- Measuring with a Calliper, Micrometer, or Dial Gauge

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LIB 3: 56 Passenger Safety Systems

Restraint Systems

- Air Bags

SRS Components and Operation

- Airbag Safety
- Airbags
- Introduction to SRS
- Seat Belts

SRS Inspection and Diagnosis

- Disabling and Enabling the Air Bag System

LIB 3: 57 Heavy Vehicle Systems

Actuators

- Engine Management Actuators - Exercise 18.1
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CI Engine Components

- HGV Diesel Engine Component Identification
- HGV Diesel Engine Cylinder Head and Valves
- HGV Diesel Engine Cylinders
- HGV Diesel Engine Pistons
- HGV Diesel Engine Systems

Diesel Engine Management

- Engine Exhaust Emissions - Exercise 6.1
- Fuel Injection

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- Fuel Injection - Exercise 18.3
- Idle Speed Adjustment - Exercise 18.6
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- HGV Gears and Gear Ratios
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- HGV Park, Tail and Headlights - Exercise 9.1
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- HGV Cold Starting Systems - Exercise 21.1
- HGV Cold Starting Systems - Worksheet 14

LIB 3: 58 Motorcycle Lighting

Fault Finding

- Fault Finding
- Four Pin Relay Headlamp Circuit Fault
- Park / Tail Lamp and Headlamp Circuit Fault
- Park / Tail Lamp and Relay Controlled Headlamp Fault
- Park / Tail Lamps Circuit Fault
- Relay-Controlled Headlamp Flash Circuit Fault

Lamp Circuits

- Instrument Panel Lighting Circuit
- Low and High Beam Headlamps
- Park / Tail Lamp and Headlamp Circuit Assignment
- Park / Tail Lamp Circuits
- Park / Tail Lamps and Headlamps
- Park / Tail Lamps and Relay Controlled Headlamps

Automotive

Relay Circuits

- Four Pin Relay Headlamp Circuit Assignment
- Four Pin Relays and Headlamps
- Relay-Controlled Headlamp Circuit
- Relay-Controlled Headlamp Flash Circuit

LIB 3: 59 Land Cruiser Complete Vehicle Systems

Land Cruiser Faults

- Land Cruiser Fault Diagnosis 1
- Land Cruiser Fault Diagnosis 10
- Land Cruiser Fault Diagnosis 2
- Land Cruiser Fault Diagnosis 3
- Land Cruiser Fault Diagnosis 4
- Land Cruiser Fault Diagnosis 5
- Land Cruiser Fault Diagnosis 6
- Land Cruiser Fault Diagnosis 7
- Land Cruiser Fault Diagnosis 8
- Land Cruiser Fault Diagnosis 9

Land Cruiser Fuel Injection

- Land Cruiser Fuel Injector Pulse Frequency
- Land Cruiser Fuel Injector Pulse Timing
- Land Cruiser Fuel Injector Pulse Width

Land Cruiser Systems

- Brake System Inspection
- EVAP System Investigation
- Investigating the Door Mirror
- Investigating the Power Windows
- Land Cruiser Driveline Investigation
- Military Body Panel Materials
- Ride Height Measurement

LIB 3: 60 Dynamometers

Dynamometer Software Analysis

- Analysing Air Flow with Variable RPM (CI Engine)
- Analysing Air Flow with Variable RPM (SI Engine)
- Analysing Power with Variable RPM (CI Engine)
- Analysing Power with Variable RPM (SI Engine)
- Analysing Torque with Variable RPM (CI Engine)
- Analysing Torque with Variable RPM (SI Engine)
- Introduction to Dynamometer Software

Automotive

Engine Dynamometer Measurements

- Calculating Power with Variable RPM (CI Engine)
- Calculating Power with Variable RPM (SI Engine)
- Introduction to Dynamometers
- Measuring Air Flow with Variable RPM (CI Engine)
- Measuring Air Flow with Variable RPM (SI Engine)
- Measuring Cylinder Pressure with Variable RPM (CI Engine)
- Measuring Cylinder Pressure with Variable RPM (SI Engine)
- Measuring Fuel Use with Variable RPM (CI Engine)
- Measuring Fuel Use with Variable RPM (SI Engine)
- Measuring Oil Pressure with Variable RPM (CI Engine)
- Measuring Oil Pressure with Variable RPM (SI Engine)
- Measuring the Effect of Load on Torque (CI Engine)
- Measuring the Effect of Load on Torque (SI Engine)
- Measuring Torque with Variable RPM (CI Engine)
- Measuring Torque with Variable RPM (SI Engine)

Support

LIB 3: 61 Engineering Mathematics

Algebra

- Algebra - Simple Formula
- First, Second, and Third Order Brackets
- Rule of Three (Direct Proportion)
- Rule of Three (Inverse Proportion)

Angles

- Angular Measure
- Calculating with Angles
- Measuring Angles

Approximation

- Approximations

Arithmetic

- Adding and Subtracting
- Multiplication and Division of Decimal Numbers
- Multiply Sums

Equations

- Addition Method for Solving Simultaneous Equations
- Calculate the Unknown Variable in an Equation
- Distributive Law
- Equating Method for Solving Simultaneous Equations
- Multiply Out Brackets
- Performing Calculations
- Sign Rules for Mathematical Operations

Factorization

- Simple Factorization

Fractions

- Add and Subtract Fractions with Different Denominators
- Add and Subtract Fractions with the Same Denominator
- Convert Decimal Numbers to Fractions
- Convert Fractions to Decimal Numbers
- Convert Improper Fractions into Mixed Numbers
- Convert Mixed Numbers into Improper Fractions
- Expand Fractions
- Fractions - Addition and Subtraction
- Fractions - Multiplication and Division
- Simplify Fractions

Graphs and Charts

- Graphs - Pie Chart
- Graphs - Square Law
- Graphs - Straight Line Graphs

Support

Indices

- Indices
- Indices - Addition and Subtraction
- Indices - Letter Notation
- Indices - Multiplication and Division
- Indices - Powers of 10
- Powers

Length, Area and Volume

- Calculate the Area of a Complex Shape
- Calculate the Area of a Rectangle
- Calculate the Perimeter of a Rectangle
- Calculate Volume
- Lengths, Surface Area and Volume
- Lengths, Surface Area, and Volume
- Lengths, Units and Prefixes

Number Systems

- Binary and Decimal Conversions

Percentages

- Calculate Percentage Increases
- Calculate Percentage Reductions
- Calculate Percentages of Values
- Parts per Thousand
- Percentages

Phasors

- Phase Angles
- Phasor Diagrams

Trigonometry

- Basic Trigonometry
- Lengths and Pythagoras' Theorem
- Pythagoras' Theorem

LIB 3: 62 English Language Skills

Language

- Language Acquisition

Reading

- Citing Strong and Thorough Evidence
- Determining a Writer's Perspective
- Evaluating Arguments and Specific Claims Made in a Text
- Identifying and Analysing Ideas in a Text

Support

Speaking and Listening

- Discussing Different Perspectives
- Engage in a Two-Way Conversation
- Engaging in Group Discussions
- How to Introduce Yourself
- Justifying Decisions with Reasoning
- Listening and Understanding
- Planning, Writing, Presenting, and Evaluating
- Presenting a Perspective to an Audience

Writing

- Arguing a Perspective
- Creating an Informative Text
- Formal Letters with a Perspective
- Informing an Audience
- Presenting a Persuasive Perspective

LIB 3: 63 Business Skills

Cost Accounting

- Marginal Cost Calculations

Economics

- Economic Flow Models
- Economic Measures
- Economic Systems
- Location Factors
- Monetary Policy and Price Level Stability
- Needs, Wants and Demand
- Pricing and Types of Markets
- Production Factors

Financial Accounting and Bookkeeping

- Accounting - Valuation Principles
- Accruals and Pre-Payments
- Balance Sheet Accounting
- Balance Sheet Changes
- Inventory Accounting: The Periodic Method
- Inventory Accounting: The Perpetual Method
- List Price Determination
- Profit and Loss Accounts
- Purchase Cost Calculations

Fundamentals of Business Organization

- Business Organizational Structure
- Business Process Optimization
- Corporate Mission and Goals
- Quality and Environmental Management

Support

Investing and Financing

- External Financing
- Financing Rules
- Internal Financing
- Investment Analysis
- Investment Planning
- Profit and Loss Analysis

Legal Framework

- Breach of Contract
- Contracts and UN Law
- Process Chains and Networks

Procurement

- Controlling Procurement
- International Commercial Terms and Contracts
- Management of Hazardous Substances
- Material Procurement
- Material Requirements Planning (MRP)
- Monitoring Purchasing
- Organizing Procurement
- Purchasing Calculations

Production

- Analytical Techniques
- Controlling Production
- Improving Production
- Product Range
- Product Range Development
- Production Management
- Production Planning
- Production Process Control
- Production Process Planning
- Quality Control

Sales and Marketing

- Advertising and the Marketing Mix
- Communications and the Marketing Mix
- Control of the Customer's Order
- Distribution and the Marketing Mix
- Marketing Planning
- Pricing Strategies
- Product and the Marketing Mix
- Product Promotion
- Sales and Marketing Measures

Social Skills

- Common Courtesy
- Dress Code

Support

- Handle Collective Property
- Personal Space
- Punctuality

LIB 3: 64 Freight Logistics

Efficiency and Optimization of the Warehouse

- Quality Management in the Warehouse

Event Driven Process Chains

- EPC Diagrams

Human Resources

- Accident Prevention in the Warehouse
- Handling of Hazardous Materials

Information Processing

- Privacy Policy

Internal Transport and Loading

- Conveying
- Internal Transport and Loading Overview
- Loading Systems
- Picking Vehicles and Lifting Equipment
- Securing Loads

Loading

- Loading Goods Overview

Packaged Goods

- Packaging
- Packaging Aids
- Packaging of Goods

Picking Stock

- Key Figures of Picking
- Organization of Picking

Route Planning

- Accompanying Documents
- Event Driven Process Chain for Route Planning
- Freight Costs
- Legal Regulations for Shipping

Stowage Planning

- Planning for Stowage

Support

LIB 3: 65 Workplace Problem Solving

Construction

- Car Park Construction - Calculating Materials
- Installing a Flag Pole
- Perimeter Fencing - Calculating Materials

Customer Service

- Handling a Telephone Call

Distribution

- Calculating Shipping Costs
- Planning Logistics

Finance

- Calculating Costs for a Building Project
- Calculating Stationery Costs
- Calculating VAT Rates
- Comparing Crane Hire Costs
- Phone Contracts - Comparing Deals

Human Resources

- Attending a Meeting
- Choosing a Computer Monitor
- Improving the Workplace

Production

- Calculating Costs in a Food Factory
- Choosing Packaging for Parts
- Comparing Machine Productivities
- Machine Productivity for Cutting Metal Shapes
- Mass Production - Calculating Quantities
- Paint Mixing - Calculating Materials
- Programming a Drinks Bottling Plant
- Running a Bicycle Parts Production Line
- Running Two Production Lines for Bicycle Parts
- Setting Up a Paint Filling Machine

Sales and Marketing

- Calculating Sales Discounts
- Sales Conversion - Calculating Rates



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