

# **Autodata** **TRAINING**

## **COURSE GUIDE**

2020



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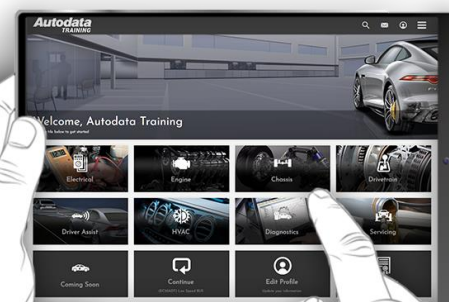
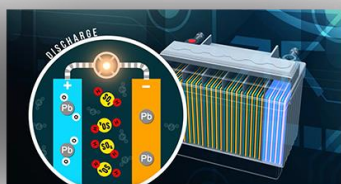
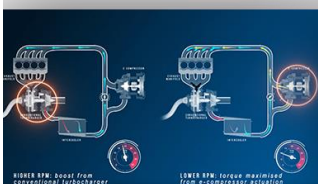
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## **A01.1 - Mastering Electrical Principles**

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- CC50 *Electron Theory, Conductivity & Ohm's Law*
- CC51 *Understanding Electrical Principles – Water Analogy*
- CC55 *Practical Uses For Ohms Law*
- CC60 *The 5 Elements That Every Circuit Has To Have*
- CC61 *Understanding Circuit Protection*
- CH50 *Series & Parallel Circuits*

## **A03.1 - Essential Multimeter Skills**

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- MM00 *Fundamental Multimeter Functions*
- MM05 *Measuring Amps, Volts & Resistance*
- MM10 *Understanding Duty Cycle & Pulse Width Modulation*
- MM20 *Testing Diodes & Continuity*

## **A04.1 - Advanced Multimeter Skills**

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- 2020 *Manual Mode & The Relative Function*
- 2020 *Min Max Function & Bluetooth*
- 2020 *Using an Ammeter as Jump Wire*
- 2020 *Relative Compression & Secondary Ignition Testing*

## **A08.1 - Diagnosing Circuit Faults**

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- CK50 *Open & Short Circuits*
- CV50 *Terminal Tension & Back Probing*
- CW70 *What is Voltage Drop?*
- CW71 *Single Circuit Voltage Drop Checks*
- CW73 *Using Voltage Drop as a Diagnostic Tool*

## **A10.1 - Wiring Harness Fundamentals**

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- 2020 *Automotive Cable Selection*
- 2020 *Automotive Cable Crimping and Termination*
- 2020 *Automotive Soldering*
- 2020 *Automotive Cable Size Calculations*
- 2020 *Deutsch and Weather-proof Connectors*
- 2020 *Wiring loom repairs (Connectors, wires, CAN)*

## **A20.1 - Automotive Relays Explained**

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- CM50 *Automotive Relays*
- JE50 *Relay Circuits*
- CM70 *Monitored Relay Circuits*

## **A30.1 - Understanding Sensors**

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- CO50 *Electronic Components*
- CP50 *Piezo Resistive Sensors Explained*
- CP60 *Piezo Electric Sensors Explained*
- CP70 *Capacitive Sensing*
- CP80 *Ultrasonic Sensor Technology*

## **A40.1 - Mastering Control Modules**

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- CJ50 *Circuit Operation & Voltage Dividers*
- JC75 *Pullup & Pulldown Circuits*
- JC85 *Control Module Logic & Programming*
- ET00 *J2534 Pass-Thru Communication*

## **A50.1 - Electrical Waveforms Explained**

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- JL50 Oscilloscope Essentials*
- CR00 Current Limiting Technology*
- CR50 Pulse Width Modulation Explained*
- JL60 Interpreting Position Sensor Waveforms*
- JL70 Interpreting Pressure Sensor Waveforms*

## **A60.1 - Testing & Charging Batteries**

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- CW00 Batteries - Lead Flooded*
- CW15 Lithium Battery Technology*
- CW30 Battery Test, Maintenance and Recharge*
- CW42 Locating Parasitic Drain*
- ES15 Smart Battery Charger Technology*

## **A64.1 - Understanding Charging Systems**

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- CW60 Alternators Explained*
- CW62 Alternators - Current Rectification*
- CW64 Alternators - Voltage Regulation*
- CW66 Best Practice Alternator Testing Guide*

## **A67.1 - Smart Charging Technology**

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- CW80 Charging Systems ECM Controlled*
- CW90 ECM Controlled Charging Diagnosis*

## **A70.1 - Mastering Starter Systems**

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- FT50 Starter Motors Explained*
- EM00 Direct Current Motors*
- KB48 Starter Circuit Voltage Drop Testing*
- FX23 Start Stop Battery Technology*
- FX25 Start Stop Operation*

## **A80.1 - Modern Vehicle Networks**

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- EC50 Low Speed BUS*
- EH50 CAN High Speed BUS*
- FB00 Understanding FlexRay*
- ES50 MOST BUS*
- EM50 LIN BUS*
- 2020 LAN*
- 2020 Communication Network Diagnosis*
- 2020 Best Practice Network Repair*

## **C01.1 - Tyre & Rim Essentials**

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- FX00 Tyre Technology*
- FX05 Tread and Rim Technology*
- FX15 Understanding Run-Flat Tyres*
- FX50 Tyre Pressure Monitoring*

## **C02.1 - Best Practice Tyre Fitment**

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- FX70 Best Practice Standard Wheel Balancing*
- FX65 Best Practice Standard Tyre Strip & Fit*
- FX67 Best Practice Low Profile/ Run Flat Tyre Strip & Fit*

## **C10.1 - Introducing Suspension Components**

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- FR05 Suspension Components - Springs*
- FR10 Suspension Components - Shocks*
- FR15 Suspension Components - Linkages*
- FR17 Suspension Components - Anti Roll*
- FR19 Suspension Components - Bushes*

## **C11.1 - Understanding Suspension Systems**

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- 2020 Live Axle*
- 2020 Torsion Bar*
- 2020 Wishbone*
- 2020 Macpherson Strut*
- 2020 Multi Link*
- 2020 Virtual Pivot Point suspension*

## **C12.1 - Advanced Suspension Technology**

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- FR20 Air Suspension Overview*
- FR12 Active Shocks*
- 2020 Active roll stabilisation*
- 2020 Fundamentals of vehicle dynamics*
- 2020 Advanced suspension jacking points*

## **C20.1 - Complete Steering Systems**

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- FP00 Manual Steering Principles*
- FP05 Hydraulic Power Steering*
- FP40 Electro-Hydraulic Power Steering*
- FQ50 Electric Power Steering*
- 2020 Steering System Diagnosis*
- 2020 Steering System Repair*

## **C30.1 - Mastering Wheel Alignments**

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- FQ70 Understanding Steering Angles*
- 2020 Wheel Alignment Best Practice*
- 2020 Advanced Wheel Alignment*
- 2020 Fundamentals of vehicle chassis dynamics*
- 2020 Chassis Dynamics Diagnosis & Repair*

## **C40.1 - Braking System Essentials**

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- BK00 Automotive Braking Principles*
- BF00 Understanding Brake Fluid*
- BK12 Brake Master Cylinder Operation*
- 2020 Drum Brake Operation and Diagnosis*
- BK23 Disc Brake Systems*
- 2020 Multi Piston Caliper systems*

## **C50.1 - ABS Operation & Testing**

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- FC50 Anti-Lock Brakes*
- MH25 Wheel Speed Sensor Operation & Testing*
- MH50 Wheel Speed Sensor Circuit Fault*
- MK50 ABS Pump Motor Circuit Diagnosis*



## **D10.1 - Passive Assist Technology**

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*FW50 Collision Avoidance Camera Type*

*FW25 Lane Departure Passive Type*

*FV50 Blind Spot & Cross Traffic Alert*

## **D20.1 – ADAS Fundamentals**

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*2020 Introducing Advanced Driver Assist Systems*

*2020 Understanding the Operating Principles of ADAS*

*2020 Ultrasonic Sensors Explained*

*2020 Radar Sensors Explained*

*2020 Camera Sensors Explained*

*2020 LIDAR Sensors Explained*

*2020 Localisation and V2X Communications Explained*

## **D40.1 - ADAS Calibration Guide**

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*2020 ADAS Calibration Tool Introduction*

*2020 ADAS Front Camera Calibration*

*2020 ADAS Front Radar Calibration*

*2020 ADAS Rear Camera Calibration*

*2020 ADAS Diagnostics*

## **D55.1 - Understanding Stability Control**

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*FH50 Traction Control*

*FJ50 Stability Control*

*FY60 Launch Control Systems*

*FJ60 Hill Descent*

## **D70.1 - Safety & Comfort Systems**

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- YA20 *Rain Sensor Technology*
- FT70 *Heads Up Display Systems*
- FX50 *Tyre Pressure Monitoring*
- YA60 *Wireless Phone Charging*

## **D85.1 - SRS Airbag Essentials**

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- FJ80 *SRS Airbag Safety*
- FJ90 *SRS Airbag Operation*
- MN50 *SRS Pretensioners*

## **T01.1 - Complete Clutch Essentials**

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- CS00 Clutch System Principles*
- CS02 Multiplate Clutch Systems*
- CS10 Dual Mass Flywheel Principles*
- CS40 Conventional Clutch Diagnostics*

## **T10.1 - Manual Transmissions Explained**

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- MT00 Manual Transmission Operation*
- MT10 Understanding Manual Transaxles*
- 2020 Manual Transmission Diagnosis & Repair*

## **T20.1 - Dual Clutch Transmission Essentials**

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- NS00 Introducing DCT*
- 2020 Mechatronics*
- 2020 Programming & Operating Modes*
- 2020 Failure Modes*

## **T40.1 - Mastering Automatic Transmissions**

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- VD80 Automatic Transmission Fluids*
- AT00 Torque Converter Operation*
- AT10 Planetary Gear Sets*
- AT15 Automatic Transmission Operation*
- AT20 Automatic Transmission Hydraulics*
- AT25 Electronic Transmission Control*

## **T90.1 - Understanding Final Drives**

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- FD00 Understanding Final Drives*
- FD30 Limited Slip Differentials*
- FD05 Driveshaft, Universal and CV Joint Operation*

## **G00.1 - Mastering Onboard Diagnostics**

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- SB00 Strategy Based Diagnostics*
- OB00 On-Board Diagnostics - Generation 1*
- OB05 On-Board Diagnostics - Key Elements*
- OB10 On-Board Diagnostics - Key Elements 2*
- JB50 Understanding Diagnostic Trouble Codes*
- AC50 Understanding Drive Cycles*
- AC65 Drive Cycle Diagnosis*

## **G05.1 - Engine Misfire Diagnostics**

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- AD50 Engine Misfire Monitoring*
- AD60 Undetermined Misfire Diagnostics*
- DS50 Automotive Thermal Imaging & Diagnostics*

## **G10.1 - NVH Principles & Diagnostics**

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- CI30 Understanding NVH - Noise*
- CI32 Understanding NVH - Vibration*
- CI34 Understanding NVH - Harshness*
- CI36 Understanding NVH - Diagnostics*

## **G15.1 - Starter Relay Diagnostics**

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- KB50 Starter Relay Circuit Malfunction Diagnostics*
- KB60 Starter Relay Circuit Voltage Low Diagnostics*
- KB65 Starter Relay Circuit Voltage High Diagnostics*

## **G20.1 - Oil Pressure Sensor Diagnostics**

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- KT50 Oil Pressure Sensor Circuit – Voltage Low Diagnosis*
- KT60 Oil Pressure Sensor Circuit – Voltage Low Diagnosis*
- KT70 Oil Pressure Sensor Signal Performance*

## **G25.1 - Crankshaft Sensor Diagnostics**

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- KN50 Crankshaft Position Sensor Signal Performance*
- KN55 Crankshaft Position Sensor Signal Voltage Low*
- KN60 Crank Shaft Position Sensor - Signal Voltage High*
- KN65 Crankshaft Position Sensor Intermittent Signal*

## **G30.1 - Camshaft Sensor Diagnostics**

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- KO50 Cam Position Actuator Valve - Negative Control*
- KO55 Cam Position Actuator Valve - Positive Control*
- CP05 Camshaft Position Sensor Voltage Low*
- CP10 Camshaft Position Sensor Voltage High*

## **G35.1 - MAF Sensor Diagnostics**

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- KQ50 Mass Air Flow Sensor Signal Performance*
- KQ60 Mass Air Flow Sensor Short to Ground*
- KQ70 Mass Air Flow Sensor Signal Voltage High*

## **G40.1 - MAP & BARO Sensor Diagnostics**

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- KP60 MAP Sensor Pull-up Type Voltage Low*
- KP65 MAP Sensor Pull-up Type Voltage High*
- KP70 MAP Sensor Pull-down Type Voltage Low*
- KP75 MAP Sensor Pull-down Type Voltage High*
- BS25 Barometric Sensor Signal Faults*
- BS20 Barometric Sensor – Shorts to Voltage & Ground*

## **G45.1 - IAT Sensor Diagnostics**

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- KS50 IAT Sensor Circuit Voltage Low*
- KS60 IAT Sensor Circuit Voltage High*
- KS70 IAT Sensor Signal Performance*

## **G50.1 – Fuel System Diagnostics**

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|             |   |
|-------------|---|
| <i>KD50</i> | <i>Fuel Injector Circuit Low</i>            |
| <i>KD60</i> | <i>Fuel Injector Circuit Low</i>            |
| <i>KC00</i> | <i>Fuel Trim – System Too Rich</i>          |
| <i>KC05</i> | <i>Fuel Trim – System Too Lean</i>          |
| <i>KC15</i> | <i>Evaporative Systems Open Circuit</i>     |
| <i>KC20</i> | <i>Evaporative Systems Short to Ground</i>  |
| <i>KC25</i> | <i>Evaporative Systems Short to Voltage</i> |

## **G55.1 - FRP Sensor Diagnostics**

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|             |   |
|-------------|---|
| <i>KC70</i> | <i>FRP Sensor Voltage High - Pull Up Type</i>   |
| <i>KC75</i> | <i>FRP Sensor Voltage High - Pull Down Type</i> |
| <i>KC80</i> | <i>FRP Sensor Voltage Low - Pull Up Type</i>    |
| <i>KC85</i> | <i>FRP Sensor Voltage Low - Pull Down Type</i>  |

## **G60.1 - Turbocharger Diagnostics**

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|             |   |
|-------------|---|
| <i>KR50</i> | <i>Turbocharger Wastegate Type - Underboost</i> |
| <i>KR55</i> | <i>Turbocharger Wastegate Type - Overboost</i>  |
| <i>KR60</i> | <i>Turbocharger VGT Type - Underboost</i>       |
| <i>KR65</i> | <i>Turbocharger VGT Type - Overboost</i>        |

## **G65.1 - Oxygen Sensor Diagnostics**

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|             |   |
|-------------|---|
| <i>KE50</i> | <i>Narrow Band Oxygen Sensor Poor Performance</i> |
| <i>KE60</i> | <i>Narrow Band Oxygen Sensor Heater Circuit</i>   |
| <i>KF50</i> | <i>Wide Band Oxygen Sensor Pump Circuit Low</i>   |

## **G70.1 - EGR Diagnostics**

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|             |   |
|-------------|---|
| <i>KH75</i> | <i>EGR Flow Diagnostics</i>             |
| <i>KH85</i> | <i>EGR Position Signal Voltage Low</i>  |
| <i>KH86</i> | <i>EGR Position Signal Voltage High</i> |
| <i>KH87</i> | <i>EGR Signal Performance</i>           |

## **G75.1 - DPF Pressure Sensor Diagnostics**

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- VK55 *DPF Pressure Sensor Voltage High Pull Up Type*
- VK60 *DPF Pressure Sensor Voltage High - Pull Down Type*
- VK65 *DPF Pressure Sensor Voltage Low - Pull Up Type*
- VK70 *DPF Pressure Sensor Voltage Low - Pull Down Type*

## **G80.1 - Vehicle Network Diagnostics**

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- LE50 *CAN HS - Short Circuit Diagnosis*
- LE60 *CAN HS - Short to Ground or Voltage Diagnosis*
- LE70 *CAN HS - Open Circuit Diagnosis*
- EM55 *LIN BUS Diagnostics*
- ES60 *MOST BUS Diagnosis*
- LC50 *Low Speed BUS Diagnostics*

## **G85.1 - Accelerator Pedal Position Sensor**

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- KM50 *Accelerator Pedal Position Sensor Diagnosis*
- KM55 *Accelerator Pedal Position Signal Not Plausible*
- KM60 *Accelerator Pedal Position Signal Voltage Low*
- KM65 *Accelerator Pedal Position Signal Voltage High*

## **G90.1 - Electronic Stability Program Diagnostics**

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- MC50 *Steering Angle Sensor - Voltage High Diagnosis*
- FK50 *Yaw Sensor - Communication Fault*
- FK60 *ESP Bus Diagnostics*

## **G95.1 - SRS Diagnostics**

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- ML50 *SRS Airbag Open Circuit Diagnosis*
- MN60 *SRS Pretensioner Diagnosis*

## **S00.1 - Vehicle Servicing & Safety Checks**

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- TC50 High Voltage Awareness*
- UC50 Best Practice Vehicle Servicing*
- UC65 Best Practice Vehicle Safety Checks*

## **S05.1 - Cooling System Servicing**

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- KB22 Understanding Engine Coolants*
- KB48 Engine Coolant Testing*
- KB38 Best Practice Coolant Drain and Flush*
- VE40 Drive Belt Diagnosis*
- 2020 Stretch Belts*

## **S10.1 - Engine Oil Essentials**

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- KT40 Oil Filtration Principles*
- VE00 Engine Oil Viscosity and Performance Classification*
- VE05 Engine Oil - Bases, Additives & Composition*
- VE10 Engine Oil - Synthetic vs. Mineral*
- 2020 Engine Oil Selection*



## **E00.1 - Engine Mechanical Essentials**

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- BD00 4 Stroke Engine Principles*
- BD60 Relative Compression Testing*
- HB50 Gasoline Engine Mechanical Checks*
- BD50 Best Practice Head & Gasket Leak Testing*
- HR20 Understanding Valve Timing*
- HR50 VVT Cam Phasing Type*
- HR55 VVT Cam Changing Type*
- JP50 Valve Adjustment - Shim Type*
- JP75 Valve Adjustment - Rocker Type*

## **E05.1 - Cooling System Principles**

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- KB20 Cooling System Principles*
- VE35 Accessory Drive Belt Systems*
- KB35 Cooling System Diagnosis*
- KB25 Cooling Fans - Relay Controlled*
- KB28 Thermostats - ECM Controlled*
- KB30 Investigating Stray Current Corrosion*

## **E10.1 - Forced Induction Fundamentals**

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- KR10 Forced Induction System Principles*
- KR12 Twin Scroll Turbocharging System Principles*
- KR15 Twin Charge Systems*
- TE90 48 Volt Electric Turbocharger Technology*
- KY50 Understanding Turbo Surge & Flutter*
- KR11 Turbocharger Components - Bearings*

## **E15.1 - Engine Management Essentials**

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- HO60 Port Fuel Injection Delivery System*
- HO50 Gasoline Injection Fuel Control*
- HP50 Introducing Gasoline Direct Injection (GDI)*
- HG50 Understanding Fuel Trims*
- HG00 Understanding Gasoline Scantool Data*
- AE50 Throttle Actuator Control Systems*
- AF00 Cylinder Deactivation OHV Type*
- HS00 Intake Runner Control Systems*

## **E20.1 - Understanding Engine Sensors**

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- HN50 Gasoline Injection Sensors*
- HD50 Narrow Band Oxygen Sensors*
- HE50 Wide Band Oxygen Sensors*
- MA10 Mass Air Flow Sensor Hot Film Type*
- CR10 Mass Air Flow Sensor 8 Wire Type*
- JC50 2 Wire Sensors & Circuits*
- JC75 Pullup & Pulldown Circuits*
- HU50 Accelerator Pedal Position Sensor*
- KL50 Throttle Position Sensors*

## **E25.1 - Mastering Ignition Systems**

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- HC10 Kettering Type Ignition System*
- HC15 Spark Plugs*
- HC40 Spark Timing & Dwell Control*
- KE30 Spark Plug & Lead Diagnosis*
- HC50 Magneto & CDI*
- HC20 Electronic Switching Ignition Systems*
- HC30 COP & Wasted Spark*
- KE15 Ignition Coil Pack Diagnosis*

## **E30.1 - Gasoline Fuel Delivery Essentials**

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- KC55 Fuel Delivery System Mechanical Checks*
- KC60 Fuel Delivery System Electrical Checks*
- KD30 Oscilloscope Injector Diagnosis*
- KC65 Fuel Pump Control Module Checks*
- KC50 Fuel Pressure Regulator Performance (GDI)*
- AF25 Introducing Ethanol Fuel*
- AF26 E85 and Flex Fuel Vehicles*

## **E35.1 - Emission Control Fundamentals**

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- DA50 Vehicle Emission Principles*
- DC50 Exhaust Gas Recirculation*
- DE50 Vented Evaporative Systems*
- KE00 Gasoline Exhaust Emission Diagnostics*
- DH50 2 Way Catalytic Converter*
- DJ50 3 Way Catalytic Converter*
- DR50 Catalytic Converter Efficiency*
- KH50 Catalyst Efficiency Diagnostics*

## **E40.1 - Understanding Diesel Systems**

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- GE35 Diesel Unit Injection*
- GE30 Hydraulic Electric Unit Injection (HEUI)*
- GB60 Diesel Fuel Delivery - High Pressure Supply*
- GM00 2 Stroke Diesel Engine Principles*
- GM50 Diesel Engine Performance Checks*
- GP00 Glow Plug Operation*
- GP10 Indirect Glow Plug System - Testing Procedures*
- GP15 Direct Glow Plug System - Testing Procedures*

## **E45.1 - Common Rail Diesel Explained**

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- GE50*    *Introducing Common Rail Diesel (CRD)*
- GH50*    *CRD Fuel Delivery*
- GF50*    *CRD Electronic Controls*
- GK50*    *CRD Injector Coding*
- GL50*    *CRD Intake & Exhaust Systems*
- VD50*    *CRD Injector Leak Back Testing*

## **E50.1 - Diesel Emissions Technology**

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- DA50*    *Vehicle Emission Principles*
- DC50*    *Exhaust Gas Recirculation*
- DN50*    *NOx Type Catalytic Converter*
- GN50*    *DPF Diesel Particulate Filter*
- VK50*    *DPF Flow Diagnostics*
- VM00*    *SCR Selective Catalyst Reduction*
- VK60*    *DPF Regeneration*

## **H01.1 - HVAC Systems Essentials**

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- UG15 Introducing Air Conditioning*
- UG25 Air Conditioning High Side Components*
- UG40 Air Conditioning Low Side Components*
- UG80 Air Conditioning Servicing*

## **H10.1 - HVAC System Operation**

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- UG55 HVAC System - Sensor Inputs*
- UG60 HVAC System - Controls*
- UG65 HVAC Systems - Outputs*
- XJ50 Air Conditioning System Pressure Diagnosis*

## **H60.1 - HVAC Electrical Diagnostics**

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- XK50 Air Conditioning Thermistor Diagnosis*
- XK68 Sunload Sensor Voltage Low*
- XK70 Sunload Sensor Voltage High*

## **2020 – Introducing Hybrid & Electric Vehicles**

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- 2020 *Fundamentals of Vehicle Electrification*
- 2020 *Safe Working Practices & Procedures for Electrified Vehicles*
- 2020 *Micro, Mild & 48-Volt Systems*
- 2020 *Full Hybrid Systems Explained*
- 2020 *Understanding Plug-In Hybrids*
- 2020 *Pure Electric Vehicles Explained*

## **2020 – HEV Electrical Systems, Batteries & Charging**

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- 2020 *High Voltage HEV Architecture*
- 2020 *HEV Battery Technology*
- 2020 *HEV Battery Management & Control Systems*
- 2020 *Hybrid Vehicle On-Board Charging*
- 2020 *Plug-In & Pure EV Off-Board Charging*

## **2020 – HEV Mechanical Systems**

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- 2020 *AC Brushless Motor Operation & Testing*
- 2020 *Motor Generator Operation & Testing*
- 2020 *In-hub Motor Operations & Testing*
- 2020 *Regenerative Braking Explained*