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## TRAINING MODULES

November/December 2018

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# 1 - Automotive Electrical

1.1 - Electrical Principles		
CC50	Electron Theory, Conductivity & Ohm's Law	
CC55	Practical Uses For Ohms Law	
CC60	The 5 Elements That Every Circuit Has To Have	
CH50	Series & Parallel Circuits	
CJ50	Circuit Operation & Voltage Dividers	
CK50	Open & Short Circuits	
CV50	Terminal Tension & Back Probing	
CW50	Wiring Repairs Best Practices	
CW55	Locating Harness Faults Best Practices	
CW70	What is Voltage Drop?	
CW71	Single Circuit Voltage Drop Checks	
CW73	Using Voltage Drop as a Diagnostic Tool	

1.2 - Electronics		
CO50	Electronic Components	
CP50	Piezo Resistive Sensors Explained	
CP60	Piezo Electric Sensors Explained	
CP70	Capacitive Sensing	
CP80	Ultrasonic Sensor Technology	
CR00	Current Limiting Technology	
CR50	Pulse Width Modulation Explained	

1.3 - ECM Logic		
JB50	Understanding Diagnostic Trouble Codes	
JC50	2 Wire Sensors & Circuits	
JC75	Pullup & Pulldown Circuits	
JC80	Control Module Power & Ground Circuit Checks	
JC85	Control Module Logic & Programming	

1.4 - Multimeters & Oscilloscopes		
CE50	Multimeter Essentials	
CQ50	Multimeter Advanced Functions	
JL50	Oscilloscope Essentials	
JL60	Interpreting Position Sensor Waveforms	
JL70	Interpreting Pressure Sensor Waveforms	

1.5 - Starting, Charging & Batteries		
CW00	Batteries - Lead Flooded	
CW30	Battery Test, Maintenance and Recharge	
CW42	Locating Parasitic Drain	
CW60	Alternators Explained	
CW62	Alternators - Current Rectification	
CW64	Alternators - Voltage Regulation	
CW80	Charging Systems ECM Controlled	
CW90	ECM Controlled Charging Diagnosis	
FT50	Starter Motors Explained	
FX25	Start Stop Operation	
<b>KB48</b>	<b>Starter Circuit Voltage Drop Testing</b>	
KB50	Starter Relay Circuit Malfunction Diagnostics	
KB60	Starter Relay Circuit Voltage Low Diagnostics	
KB65	Starter Relay Circuit Voltage High Diagnostics	

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<b>1.6 - Body Electrics</b>		
<b>1.6.1 - Automotive Relays</b>		
CM50	Automotive Relays	
JE50	Relay Circuits	
CM70	Monitored Relay Circuits	
<b>1.6.2 - Lighting</b>		
CO35	Lighting Components	
<b>1.6.3 - Convenience Systems</b>		
YA20	Rain Sensor Technology	
YA60	Wireless Phone Charging	
<b>1.6.4 - Electric Motors</b>		
EM00	Direct Current Motors	
EM20	AC & Induction Motors	
<b>1.7 - Networks, Communications &amp; Programming</b>		
<b>1.7.1 - LIN BUS</b>		
EM50	LIN BUS	
EM55	LIN BUS Diagnostics	
<b>1.7.2 - Low Speed BUS</b>		
EC50	Low Speed BUS	
LC50	Low Speed BUS Diagnostics	
<b>1.7.3 - CAN BUS</b>		
EH50	CAN High Speed BUS	
LE50	CAN HS - Short Circuit Diagnosis	
LE60	CAN HS - Short to Ground Or Voltage Diagnosis	
LE70	CAN HS - Open Circuit Diagnosis	
<b>1.7.4 - FLEXRAY</b>		
FB00	Understanding FlexRay	
<b>1.7.5 - MOST Bus</b>		
ES50	MOST BUS	
ES60	MOST BUS Diagnostics	
<b>1.7.6 - Programming</b>		
ET00	J2534 Pass-Thru Communication	
ET50	General Motors Programming	

## 1.8 - Safety & Security

### 1.8.1 - SRS

FJ80	SRS Airbag Safety
FJ90	SRS Airbag Operation
ML50	SRS Airbag Open Circuit Diagnosis
ML55	SRS Airbag Short to Ground Diagnosis
ML60	SRS Airbag Short to Voltage Diagnosis
MN50	SRS Pretensioners
MN60	SRS Pretensioner Diagnosis

### 1.8.2 - Vehicle Entry & Security

FL10	Keyless Entry
MR50	Keyless Entry System Diagnosis
MR60	Immobiliser Systems

### 1.8.3 - Driver Assist Systems

FV50	Blind Spot & Cross Traffic Alert
FW25	Lane Departure Passive Type
FW50	Collision Avoidance Camera Type
FY50	Active Cruise Control

## 1.9 - Hybrid & Electric Vehicles

TC50	High Voltage Awareness
TD00	Motor Position Sensing - Resolvers
TD01	Motor Position Sensing – Encoders
TD50	Toyota Hybrid System II - Module 1
TD60	Toyota Hybrid System II - Module 2

## 2.1 - Common Systems

### 2.1.1 - Sensor & Inputs

#### Accelerator Pedal Position Sensor

HU50	Accelerator Pedal Position Sensor
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

#### Barometric Pressure Sensor

BS20	Barometric Sensor Shorts to Voltage & Ground
BS25	Barometric Sensor Signal Faults

#### Camshaft Position Sensor

CP05	Camshaft Position Sensor Voltage Low
CP10	Camshaft Position Sensor Voltage High

#### Crankshaft Position Sensor

KN50	Crankshaft Position Sensor Signal Performance
KN55	Crankshaft Position Sensor Signal Voltage Low
KN60	Crankshaft Position Sensor Signal Voltage High
KN65	Crankshaft Position Sensor Intermittant Signal

#### Manifold Absolute Pressure Sensor

KP50	Manifold Absolute Pressure Signal Performance
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

#### Mass Airflow Sensor

KQ10	Mass Air Flow Sensor Hot Film Type
KQ50	Mass Air Flow Sensor Signal Performance
KQ60	Mass Air Flow Sensor Short to Ground
KQ70	Mass Air Flow Sensor Signal Voltage High

#### Inlet Air Temperature Sensor

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

#### Fuel Rail Pressure Sensor

KC70	FRP Sensor Voltage High - Pull Up Type
KC75	FRP Sensor Voltage High - Pull Down Type
KC80	FRP Sensor Voltage Low - Pull Up Type
KC85	FRP Sensor Voltage Low - Pull Down Type

#### Throttle Position Sensor

KL50	Throttle Position Sensors
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## 2.1 - Common Systems

### 2.1.2 - Control System

AC50	Understanding Drive Cycles
AC65	Drive Cycle Diagnosis
AD50	Engine Misfire Monitoring
AD60	Undetermined Misfire Diagnostics
AE50	Throttle Actuator Control Systems
AF00	Cylinder Deactivation OHV Type

### 2.1.3 - Actuators & Outputs

Cam Shaft	
KO50	Cam Position Actuator Valve - Negative Control
KO55	Cam Position Actuator Valve - Positive Control

### 2.1.4 - Forced Induction

KR10	Forced Induction System Principles
KR12	Twin Scroll Turbocharging System Principles
KR15	Twin Charge Systems
KR50	Turbocharger Wastegate Type - Underboost
KR55	Turbocharger Wastegate Type - Overboost
KR60	Turbocharger VGT Type - Underboost
KR65	Turbocharger VGT Type - Overboost

### 2.1.5 - Emission Control

DA50	Vehicle Emission Principles
DC50	Exhaust Gas Recirculation
KH75	EGR Flow Diagnostics
KH85	EGR Position Signal Voltage Low
KH86	EGR Position Signal Voltage High
KH87	EGR Position Signal Performance

### 2.1.6 - On Board Diagnostics

OB00	On-Board Diagnostics - Generation 1
OB05	On-Board Diagnostics - Key Elements
OB10	On-Board Diagnostics - Key Elements 2

## 2.2 - Gasoline Fuel Systems

### 2.2.1 - Fuel Delivery

HO60	Port Fuel Injection Delivery System
HP50	Introducing Gasoline Direct Injection (GDI)
KC55	Fuel Delivery System Mechanical Checks
KC60	Fuel Delivery System Electrical Checks
KC65	Fuel Pump Control Module Checks

### 2.2.2 - Sensor & Inputs

General Sensors	
HN50	Gasoline Injection Sensors

Mass Airflow Sensor	
CR10	Mass Air Flow Sensor 8 Wire Type

Oxygen Sensors	
HD50	Narrow Band Oxygen Sensors
HE50	Wide Band Oxygen Sensors
KE50	Narrow Band Oxygen Sensor Poor Performance
KE60	Narrow Band Oxygen Sensor Heater Circuit
KF50	Wide Band Oxygen Sensor Pump Circuit Low

### 2.2.3 - Gasoline Control System

HG00	Understanding Gasoline Scantool Data
HG50	Understanding Fuel Trims
HO50	Gasoline Injection Fuel Control
KC00	Fuel Trim - System Too Rich
KC05	Fuel Trim - System Too Lean

### 2.2.4 - Ignition Systems

HC10	Kettering Type Ignition System
HC15	Spark Plugs
HC20	Electronic Switching Ignition Systems
HC30	COP & Wasted Spark
HC40	Spark Timing & Dwell Control
HC50	Magneto & CDI
KE10	Knock Sensor - Voltage High
KE15	Ignition Coil Pack Diagnosis
KE30	Spark Plug & Lead Diagnosis

### 2.2.5 - Emission Control - Gasoline

DE50	Vented Evaporative Systems
DH50	2 Way Catalytic Converter
DJ50	3 Way Catalytic Converter
DR50	Catalytic Converter Efficiency
KC15	Evaporative Systems Open Circuit
KC20	Evaporative Systems Short to Ground
KC25	Evaporative Systems Short to Voltage
KE00	Gasoline Exhaust Emission Diagnostics
KH50	Catalyst Efficiency Diagnostics

## 2.2.6 - Outputs & Actuators

HR50	VVT Cam Phasing Type
HR55	VVT Cam Changing Type
HS00	Intake Runner Control Systems
KC50	Fuel Pressure Regulator Performance
KD30	Oscilloscope Injector Diagnosis
KD50	Fuel Injector Circuit Low
KD60	Fuel Injector Circuit High
KQ90	Intake Runner Control - Solenoid Type Diagnosis

## 2.3 - Diesel Systems

### 2.3.1 - Fuel Systems

GB50	Diesel Fuel Delivery - Low Pressure Supply
GB60	Diesel Fuel Delivery - High Pressure Supply
GE30	Hydraulic Electric Unit Injection (HEUI)
GE35	Diesel Unit Injection
GE50	Introducing Common Rail Diesel (CRD)
GH50	CRD Fuel Delivery

### 2.3.2 - Sensor & Inputs

	COMING SOON
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### 2.3.3 - Diesel Control Systems

GF50	CRD Electronic Controls
GK50	CRD Injector Coding
GL50	CRD Intake & Exhaust Systems

### 2.3.4 - Actuators and Outputs

VD50	CRD Injector Leak Back Testing
VK80	Diesel Pressure Regulator Performance
VK85	Diesel Pressure Regulator Voltage Low
VK90	Diesel Pressure Regulator Voltage High

### 2.3.5 - Emission Control

DN50	NOx Type Catalytic Converter
GN50	DPF Diesel Particulate Filter
VK50	DPF Flow Diagnostics
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
VM00	SCR Selective Catalyst Reduction

### 2.3.6 - Glow Systems

GP00	Glow Plug Operation
GP10	Indirect Glow Plug System - Testing Procedures
GP15	Direct Glow Plug System - Testing Procedures

## 2.4 - Alternate Fuels

AF10	LPG Vapour System Overview
AF25	Introducing Ethanol Fuel
AF26	E85 and Flex Fuel Vehicles

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## 3.1 - Common Systems

BD00	4 Stroke Engine Principles
BD50	Best Practice Head & Gasket Leak Testing
BD60	Relative Compression Testing
HR20	Understanding Valve Timing
JP50	Valve Adjustment - Shim Type
JP75	Valve Adjustment - Rocker Type

## 3.2 - Gasoline Engine

HB50	Gasoline Engine Performance Checks
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## 3.3 - Diesel Engine

GM50	Diesel Engine Performance Checks
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## 3.4 - Cooling & Lubrication

KB20	Cooling System Principles
KB22	Understanding Engine Coolants
KB25	Cooling Fans - Relay Controlled
KB28	Thermostats - ECM Controlled
KB35	Cooling System Diagnosis
KB38	Best Practice Coolant Drain and Flush
KB40	Engine Coolant Testing
KB70	Engine Coolant Temperature Sensor Diagnostics
KT40	Oil Filtration Principles
KT50	Oil Pressure Sensor Circuit - Voltage Low Diagnosis
KT60	Oil Pressure Sensor Circuit - Voltage High Diagnosis
KT70	Oil Pressure Sensor Signal Performance

# 4 - Driveline Systems

4.1 - Clutch Systems		
	CS00	Clutch System Principles
	CS02	Multiplate Clutch Systems
	CS10	Dual Mass Flywheel Principles
	CS40	Conventional Clutch Diagnostics
4.2 - Manual Transmission		
	MT00	Manual Transmission Operation
	MT10	Understanding Manual Transaxles
4.3 - Automatic Transmission		
	AT00	Torque Converter Operation
	<b>AT10</b>	<b>Planetary Gear Sets</b>
	AT20	Automatic Transmission Operation
	NG50	6 Speed Hydramatic Service RWD
	NM50	Mercedes Benz 722.9 Transmission Service
	NT50	ZF 4HP 16 Transmission Service Check
		<b>November 2018 Coming Soon</b>
4.4 - CVT		
		COMING SOON
4.5 - Dual Clutch / Shaft		
	NS50	VW-Audi DSG Service
4.6 - Transfer Case		
		COMING SOON
4.7 - Clutch pack / Viscous Coupling		
		COMING SOON
4.8 - Final Drive / Drive Shaft		
	FD00	Understanding Final Drives

## 5.1 - Steering

FP00	Manual Steering Principles
FP05	Hydraulic Power Steering
FP40	Electro-Hydraulic Power Steering
FQ50	Electric Power Steering
FQ70	Understanding Steering Angles
MC50	Steering Angle Sensor - Voltage High Diagnosis

## 5.2 - Suspension

FR00	Suspension System Principles
FR05	Suspension Components - Springs
FR10	Suspension Components - Shocks
FR12	Suspension Components - Active Shocks
FR15	Suspension Components - Linkages
FR17	Suspension Components - Anti Roll
FR20	Air Suspension Overview

## 5.3 - Wheels

	COMING SOON
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## 5.4 - Tyres

FX00	Tyre Technology
FX05	Tread and Rim Technology
FX15	What are Run-Flat Tyres
FX50	Tyre Pressure Monitoring
FX65	Best Practice Standard Tyre Strip & Fit
FX67	Best Practice Low Profile/ Run Flat Tyre Strip & Fit
FX70	Best Practice Standard Wheel Balancing

## 6.1 - Brakes

BK00	Automotive Braking Principles
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### 6.1.1 - Conventional Hydraulic

BK12	Brake Master Cylinder Operation
BK15	Hydraulic Pressure Control & Safety Valves
BK20	Brake Booster - Vacuum Suspended
BK23	Disc Brake Systems

### 6.1.2 - Electro Hydraulic

	COMING SOON
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### 6.1.3 - Electric

FM50	Cable Actuated Electric Park Brakes
FM60	Cable Actuated Electric Park Brake Adjustment
FM75	Calliper Type Electric Park Brakes

## 6.2 - ABS

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

## 6.3 - Vehicle Dynamics

FH50	Traction Control
FJ50	Stability Control
FJ60	Hill Descent
FK50	Yaw Sensor - Communication Fault
FK60	ESP Bus Diagnostics

# 7 - HVAC Systems

<b>7.1 - Operation &amp; Servicing</b>		
<b>December 2018</b>	UG15	Introducing Air Conditioning
	<b>UG16</b>	<b>Introducing R1234yf</b>
	UG25	Air Conditioning High Side Components
	UG40	Air Conditioning Low Side Components
	UG80	Air Conditioning Servicing

<b>7.2 - Diagnosis &amp; Repair</b>		
	UG55	HVAC System - Sensor Inputs
	UG60	HVAC System - Controls
	UG65	HVAC Systems - Outputs
	XJ50	Air Conditioning System Pressure Diagnosis
	XK50	Air Conditioning Thermistor Diagnosis
	XK68	Sunload Sensor Voltage Low
	XK70	Sunload Sensor Voltage High
	XL50	Air Conditioning Compressor Clutch Diagnosis

# 8 - Vehicle Servicing

<b>8.1 - Vehicle Servicing</b>		
	UC50	Best Practice Vehicle Servicing
	UC65	Best Practice Vehicle Safety Checks

<b>8.1.1 - Engine</b>		
	VE00	Engine Oil Viscosity and Performance Classification
	VE05	Engine Oil - Bases, Additives & Composition
	VE10	Engine Oil - Synthetic vs Mineral
	VE35	Accessory Drive Belt Systems
	VE40	Drive Belt Diagnosis

<b>8.1.2- Driveline</b>		
<b>November 2018</b>	<b>VD80</b>	<b>Automatic Transmission Fluids</b>

<b>8.1.3 - Chassis</b>		
	CI30	Understanding NVH - Noise
<b>November 2018</b>	<b>CI32</b>	<b>Understanding NVH - Vibration</b>
<b>December 2018</b>	<b>CI34</b>	<b>Understanding NVH - Harshness</b>

<b>8.1.4 - Brake</b>		
	BF00	Understanding Brake Fluid

<b>8.1.5 - Body</b>		
		COMING SOON

<b>8.1.6 - Electrical</b>		
		COMING SOON

## 9.1 - Scan Tools

### Autel

#### MaxiDAS DS708

RC50	MaxiDAS DS708 Getting Started
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#### MaxiSYS Pro

RE50	MaxiSYS Pro Getting Started
RE60	MaxiSYS Pro Diagnosis Menu
RE70	MaxiSYS Pro Active Tests
RE80	MaxiSYS Pro EOBD
RE85	MaxiSYS Pro Brake Bleeding

### Autologic

#### AssistPlus

AP00	AssistPlus Getting Started
AP05	AssistPlus Diagnostic Application

### Bosch

#### KTS590

BT00	KTS590 Getting Started
BT01	KTS590 Vehicle Identification
BT02	KTS590 Managing Diagnostic Data

### Carman International

SN50	Carman Auto i-700 Overview
SN52	Carman Auto i-700 PC Integration

### DEC

QC50	Superscan 3 Getting Started
QC60	Superscan 3 Diagnosis Menu
QC70	Superscan 3 Special Functions & Actuators

### G-Scan

#### G-Scan

OC50	G-Scan Getting Started
OC70	G-Scan Codes, Data, Graphing & OBD
OC90	G-Scan Special Functions

#### G-Scan 2

OE50	G-Scan2 Getting Started
OE70	G-Scan2 Codes, Data, Graphing & OBD
OE80	G-Scan2 OBD Functions
OE90	G-Scan2 Special Functions

## 9.1 - Scan Tools

### Snap-On

#### Modis Ultra

PD50	Modis Ultra Getting Started
PD70	Modis Ultra Guided Component Testing
PD90	Modis Ultra Multimeter & Oscilloscope
PE10	Modis Ultra Scanner & EOBD

#### Modis Edge

PE11	Modis Edge Getting Started
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#### Verus Pro

PF10	Verus Pro Getting Started
PF30	Verus Pro Scanner Module
PF40	Verus Pro 4 Channel Labscope
PF50	Verus Pro OBD Direct

#### Verus Edge

PF11	Verus Edge Getting Started
PF12	Verus Edge OBD & Guided Component Tests
PF13	Verus Edge 4 Channel Labscope

## 9.2 - Shop Equipment

### 9.2.1 - Oscilloscopes

SG50	Picoscope Getting Started
SG60	Picoscope 4425
SL50	1005 V-Scope Getting Started
SL51	1005 V-Scope Component Testing
SL55	Autel MaxiScope MP408
SL60	Rohde & Schwarz RTH1002

### 9.2.2 - Programming

SM50	CARDAQ-M Getting Started
SS40	Durst 12100 Programming Power Supply
SS50	Acctiva Professional Flash Support Unit

### 9.2.3 - Emission Testing

SO50	Hanatech Leak Detector
SP50	BulletPro 502 Automotive Emission Analyser
SS05	Durst ST-05 O2 Sensor Tester & Simulator

### 9.2.4 - Electrical

SJ10	Diagnostic Box TDB003 Proximity/Smart Key Tester
SJ13	Diagnostic Box TDB006 Transponder Antenna Tester
SJ15	Diagnostic Box TDB008 Parking Sensor Tester
SJ20	Diagnostic Box TDB013 Port Protector & Booster
SJ21	Diagnostic Box TDB014 Port Tester
SJ50	CAN Test Box
SJ55	Power Probe III
SJ70	SXE VFP1000 Probe
SJ80	AutoDiagger AD100 Smart Regulator Tester
SV50	OTC 3200 Battery Tester
SS10	Durst BT-2003F Carbon Pile Load Tester
SS14	Durst BJC-2000 Wasp Jump Starter
SS15	Durst BJT-75 Dino Mobile Jump Starter

### 9.2.5 - Hand Tools

SC50	Let's Torque Wrenches
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### 9.2.6 - HVAC

ST50	JAS Oceania HVAC Starter Pack
ST70	Air Conditioning Diagnostic Tools



SB00	Strategy Based Diagnosis
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## 10.1 - OEM Providers

### Chrysler

WC50	Chrysler Group - to 2007
WC60	Chrysler Group 2007 - 2009
WC70	Chrysler Group 2010 on

### Ford

WF50	Ford Motorcraft Non-Interactive
WF60	Ford Motorcraft Interactive

### General Motors

WG50	General Motors eSI
WG60	General Motors eSI Bus Schematics

### Honda

WH50	Honda - to 1995
WH55	Honda 1996 - 2005
WH60	Honda 2006 - 2011
WH65	Honda - 2012 on

### Hyundai

WH70	Hyundai - to 2000
WH75	Hyundai 2001 - 2006
WH80	Hyundai 2007 - 2010
WH85	Hyundai 2011 on

### KIA

WK50	Kia Tech Info - Service Materials
WK55	Kia Tech Info - Publications
WK60	Kia Tech Info - Diagnostic Tools & Equipment

### Mitsubishi

WM40	Mitsubishi Motors Service Information Retrieval
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### Subaru

WS50	Subaru Technical Information System
WS55	Subaru Technical Information Circuit Diagrams

### Toyota

WT50	Toyota - to 2005
WT60	Toyota - 2006 on

### Volkswagon Auto Group

WV50	Volkswagon Auto Group
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## 10.2 - Aftermarket Providers

### AutoData

WA50	Autodata - Pre 2015 Update
WA55	Autodata - Service & Powertrain
WA60	Autodata - Chassis, Body & Interior
WA65	Autodata - Electrical
WA70	Autodata - General & Estimate Calculator