COLLISION INDUSTRY
CONFERENCE

Quick Start Guide
Pre-and Post Scanning

Emerging Technologies
Tools Subcommittee

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Getting Started, Pre and Post Repair Scanning

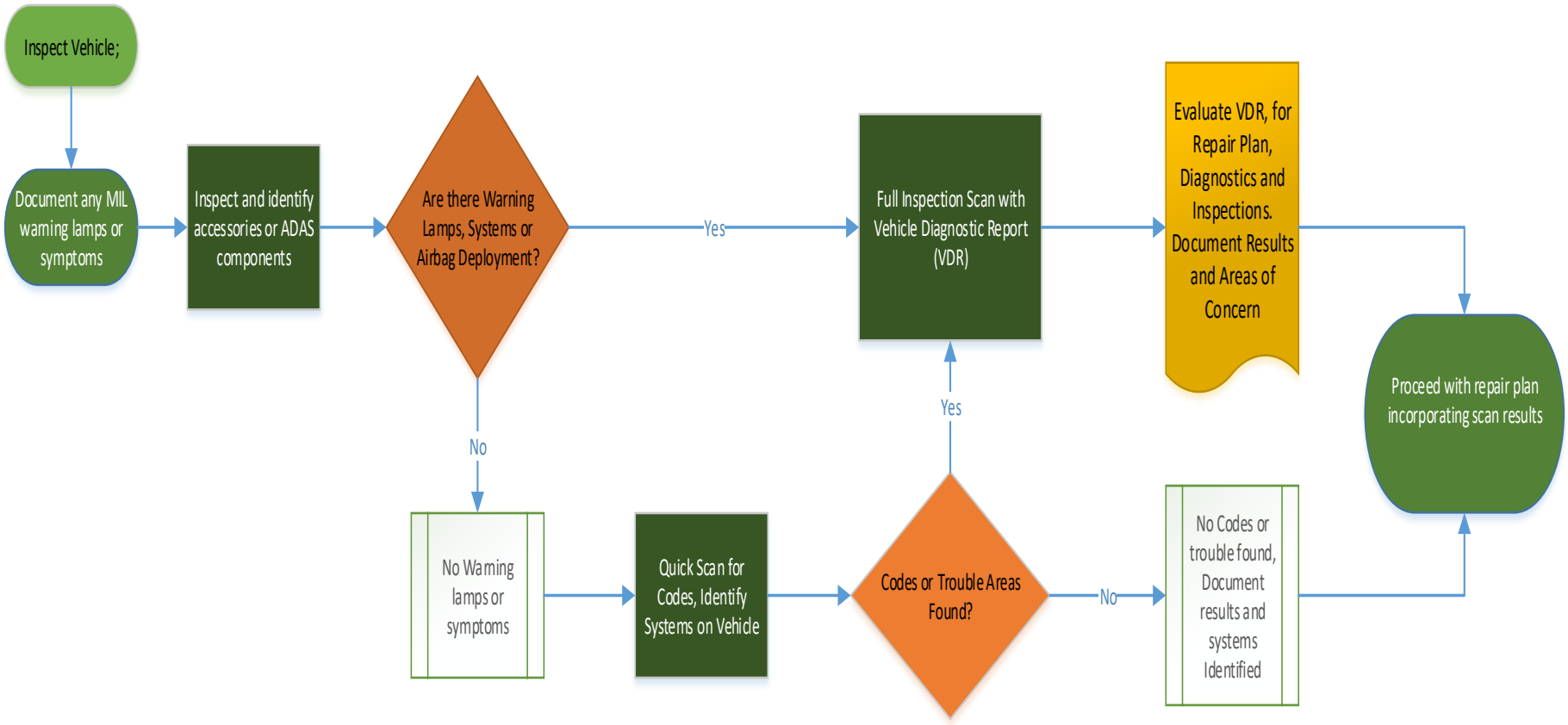
Pre- and Post-scanning solutions available for collision diagnostics vary widely for applications and capabilities. Some tools or services are applicable for a “Triage” function before repairs or basic recalibrations and code clearing at the end of repairs.

Shop owners, managers, technicians, estimators etc. must understand the capabilities of each option and/or the capabilities of tools or service selections they make. Ensure the tool you choose also performs calibrations and module programming as body shops will handle more of these job functions in the future (not sublet).

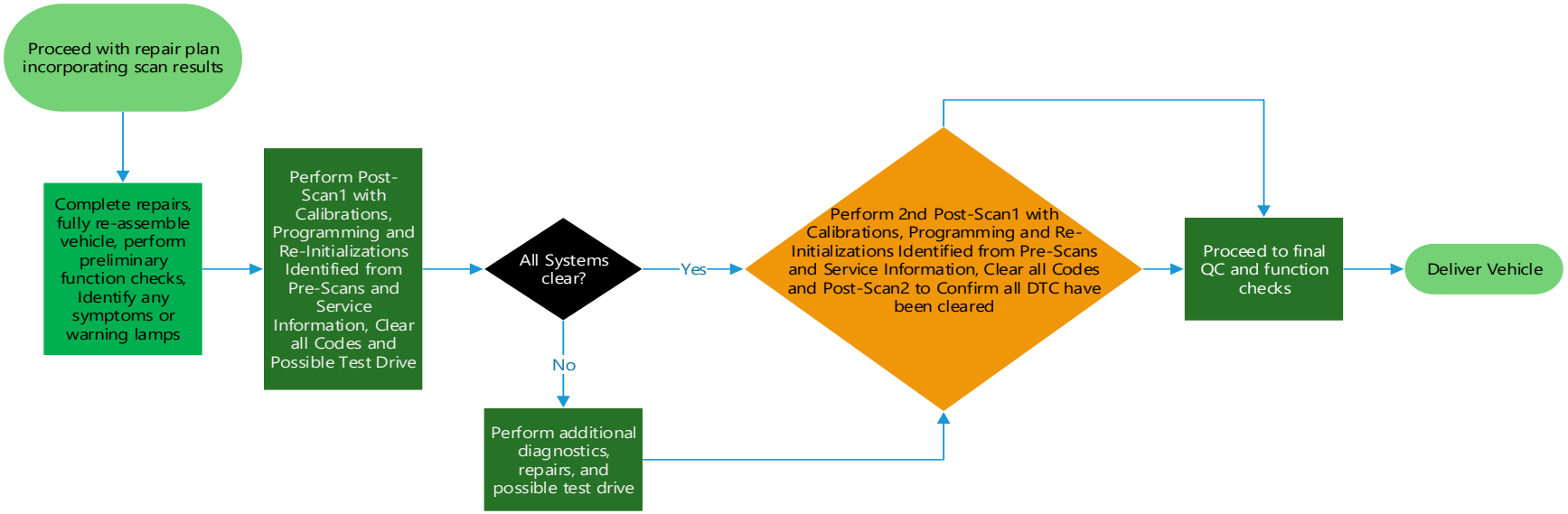
Scan-Tools must have “enhanced” functionality for all electronically controlled systems including braking, lighting, park assist, airbag, stability control and more. Scan tools also vary by other types, such as hand held, PC-based software with vehicle interfaces (DLC cable connection to the vehicle). OEM scan tools, aftermarket multiline scan tools, specialty scan tools, and remote scan tools or services all vary by these types. A qualified technician, whether in-house or a remote service, who is proficient with diagnostic process and software management with access to OEM service information, is required to perform operations beyond basic code retrieval and clearing.

It is important to note that basic code readers and tools described as OBD-II “AKA Generic” are NOT effective for scanning systems beyond powertrain emission controls (engine and transmission).

Pre-Repair Scan Sequence



Post-Repair Scan Sequence



Research & Evaluate Before You Act…

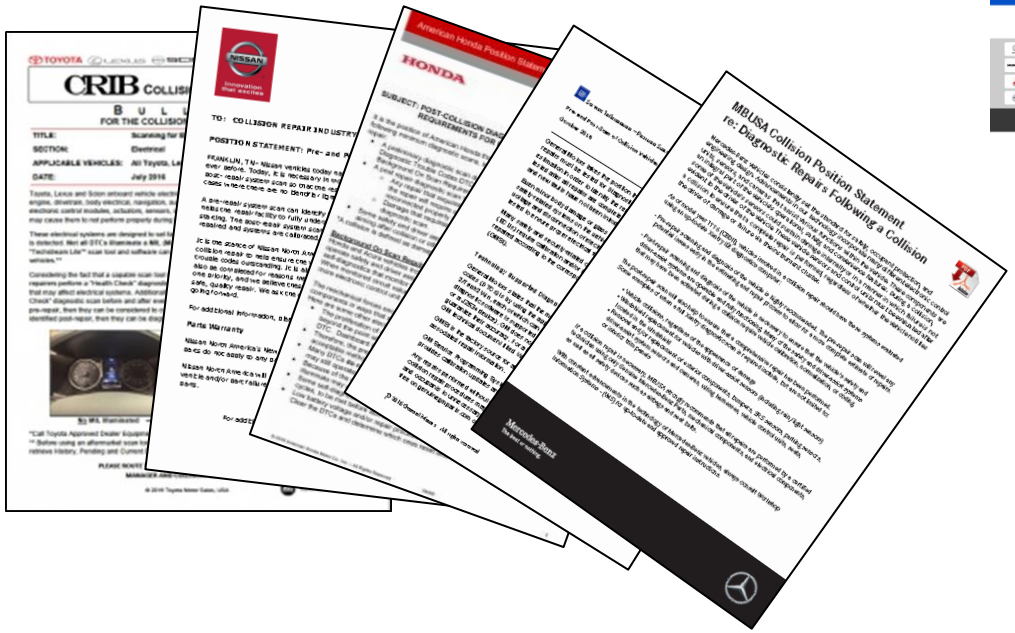
- Review current SOPs to integrate scan procedures into your operation
- Before you make a service provider or scan tool purchase decision, determine what you need and why based on your work mix and shop personnel skill sets
- Review your own shop data going back at least 6 months, and assign a percentage to each manufacturer line and model years for which you are certified or specialize in
- Decide how much your shop will handle vs. sublet: Pre-and Post- Scanning? Diagnostics? Calibrations? Programming? ADAS?
- What will your shops solution be? Remote Services? Sublet? Mobile Services? OEM Scan-Tools? Aftermarket Scan-Tools? Both?

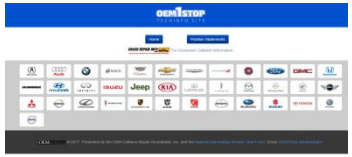
Review Your Shop's IT Infrastructure

- Evaluate your shop's current IT (Internet and Wi-Fi) infrastructure and ensure it is up to date. Using scan tools and/or services will require a professional IT infrastructure with Wi-Fi and/or cabled access for a scan tool or service to download OEM files, scan tool updates, or for remote services
- Evaluation should be done periodically for all functions relying on IT infrastructure
- Perform preliminary test by using www.speedtest.net from a tablet or smart phone
- If download or upload speeds are slow, identify bottlenecks and make necessary corrections for scan-tool updates or remote services to operate smoothly

Learn what is required for each manufacturer

- OEM position papers and service information requirements





NASTF
NATIONAL AUTOMOTIVE SERVICE TASK FORCE

ALLDATA

Mitchell RepairCenter™ TechAdvisor

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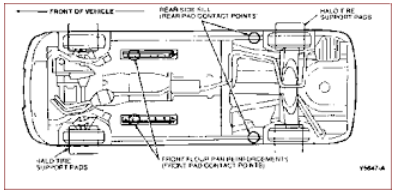
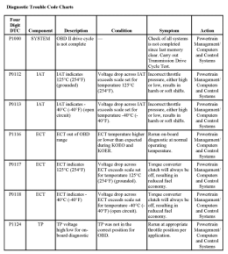
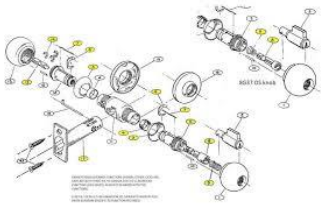
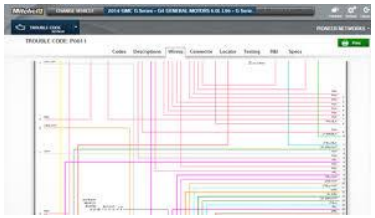
Service Information

- Service information is critical to determine required diagnostic scan tool functions and necessary calibration procedures based on vehicle damage and parts replacement or R&I
- Review service information needs; access, update, or acquire subscriptions as needed
  - ✓ Direct OEM Service Options, www.oem1stop.com
  - ✓ 3rd Party OEM Options: ALLDATA, Mitchell, IdentiFix, etc.









Collision Facility Scanning Options

Choose one or several of the following options:

1

"In House"

Independent scanning

Purchase diagnostic tools

Aftermarket and/or OEM scan tools

Get tech(s) trained in advanced diagnostics

Train or hire a dedicated mechanical/electrical/diagnostic specialist

2

"In House"

Remote Scanning and Diagnostic service providers

Coverage, Coverage, Coverage

Review provider's capabilities for diagnostics, calibrations and module programming

Review additional equipment needed

Some training is needed

3

"Outsource"

Sublet to a mobile diagnostic specialty service

Locate and establish relationship with mobile provider(s)

Review mobile provider's tool and service capabilities

Schedule services within mobile service availability

4

"Outsource"

Sublet to a dealer or independent service department

Locate nearby Dealers or Independent specialty shops that service the vehicles in your work mix

Establish relationships with Dealer/Independent service departments

Schedule and transport for services

OEM Scan-Tools

- These tools use their manufacturer diagnostic protocols and are designed and supported for use in the specified OEM line of vehicles. Some of these tools can be very expensive to acquire and maintain.
- They are designed to be directly connected to a vehicle for ALL the functions required for a manufacture's capabilities in all areas of the vehicle.
- In the last few years OEM scan-tool software has become more accessible and is available for many manufacturers on short term subscriptions as needed.
- These software packages are PC based programs and use OEM validated J2534 interfaces that are compatible with the vehicles and software packages.

OEM Scan-Tools

- **Strengths:**
- OEM scan tool software updates are normally released shortly after or at the time new vehicle platforms or new model year is made available for sale or when updated programs to improve existing functions are released.
- This increases the likelihood of coverage and capabilities.
- Full coverage and functions available from OEM
- For a shop that specializes in 1 or 2 OEM manufacturers and employs a diagnostic specialist, an OEM scan tool approach may be the best solution.
- Includes module programming and set up capabilities (additional subscriptions required)

OEM Scan-Tools

- **Weaknesses:**
- These tools are limited to coverage of their respective OEM only.
- Separate scan tools and subscriptions are needed for each manufacturer and/or year range of vehicles serviced.
- Requires maintaining the software updates for tool and OEM subscriptions to obtain programming file downloads and service information needed to apply the functionality.
- Some manufacturers have multiple versions of their OEM scan tools that cover certain model years and may be available in either the original handheld design or as a PC application.
- Some original version OEM tools have been discontinued and replaced with emulated software programs.
- For some OEMs, the user must have multiple diagnostic platforms or scan tools for different models of vehicles as the newer platforms are not reverse compatible with older MY vehicles.
- Shop must employ and train diagnostic specialists proficient in diagnostics and scan tool use/maintenance
- Shop must document and bill procedures appropriately from each different tool.

Aftermarket Scan-Tools

- A scan tool's ability to retrieve and clear trouble codes, acquire lines of data for multiple manufacturers to read sensor output, observe data, activate actuators or perform special re-learn or calibration functions depends on the tool.
- Some capabilities are common to almost all scan tools beyond OBD-II generic scanners to varying degrees.
- Higher-level, enhanced scan tools provide a decent number of lines of information and do a good job of giving information on numerous applications.
- The highest-level top tier aftermarket scan-tools contain most or all "re-learn" and calibration procedures. This will also vary by vehicle and the level of software in the tool.
- Today's aftermarket scan tools can be 6 months to 2 years behind for full procedures for the current model year release.
- Depends on the tool makers' ability to acquire and develop software.
- Some aftermarket tools have specialized coverages for "Asian" "Domestic" or "European" applications depending on the tool and tool manufacturer.
- Detailed description of varying levels of Aftermarket scan–tools follow

Top Tier Aftermarket Scan-Tools

- Contains OEM sourced software and coverage for all systems found in today's vehicles
- Model year coverage is typically 6 months within current model year
- Can be specific or limited to certain manufacturer groups (Domestic, Asian, European)
- Updates are typically available quarterly with some available more frequently.
- Includes codes and data for Chassis, Body and Powertrain
- Enhanced manufacture specific codes and data are available for most common systems. (Engine, Transmission, ABS, Air Bag, and many Body controls.)
- Coverage and capabilities vary depending on tool maker preference and/or software packages purchased by customer
- Contains most or all scan tool based calibration procedures such as; occupant detection, steering angle, yaw rate, active lighting, ADAS, etc.

Advanced Aftermarket Scan-Tools

- Contains software and coverage for the most common systems found in today's vehicles
- Model year coverage is typically 1 or 2 years behind current model year
- Can be specific and limited to certain manufacturer groups (Domestic, Asian, European)
- Updates are typically released annually
- Includes codes and data for Chassis, Body and Powertrain
- Enhanced manufacture specific codes and data are available for most common systems. (Engine, Transmission, ABS, Air Bag, and many Body controls.)
- Coverage and capabilities vary depending on tool maker preference and/or software packages purchased by customer
- Contains many scan tool-based calibration procedures such as: occupant detection, steering angle, yaw rate, active lighting

Mid-Level Enhanced Aftermarket Scan-Tool

- Contains software and coverage for the most common systems found in today's vehicles
- Model year coverage is typically 2- years behind current model year
- Can be specific and limited to certain manufacturer groups (Domestic, Asian, European)
- Updates are typically released annually
- Includes codes and data for Chassis, Body and Powertrain
- Enhanced manufacture specific codes and data are available for the most common systems. (Engine, Transmission, ABS, Air Bag, and many Body controls.)
- Coverage and capabilities vary depending on tool maker preference and/or software packages purchased by customer
- May contain most common scan tool based calibration procedures such as; occupant detection, steering angle, Idle learn.

Basic Lower Level Basic Scan Tools

Basic OBD-II tools are **NOT** applicable for Collision Related Pre-or Post scanning

- Enhanced OBD-II
- Basic OBD-II with data stream
- Basic OBD-II Code Reader

- Body, Chassis and Airbag System functions are **NOT** included
- Manufacture coverage is dependent on the software purchased form the tool provider.
- Reads and clears emission-related generic trouble codes only
- Some can show if emissions-related test monitors have passed.
- Some include Freeze Frame data for emission related codes only

Remote Scanning and Diagnostic Service Providers

- Currently there are 2 different approaches to providing remote services with pre-and post-scanning, calibrations and programming capabilities.
- Capabilities and vehicle coverage vary by each approach
- These methods offer on-demand services that reduce or eliminate the need to transport vehicles.
- These methods may use aftermarket and/or OEM scan-tool sources and employ diagnostic specialists to operate scan-tools, interpret results and perform programming and/or calibrations
- There are distinct differences with each approach
- Several companies are researching and developing additional Remote Service Options

Direct Connect Scan-Tool with Remote Access

- This method involves placing a scan tool system with both OEM J-2534 and OEM compatible 3rd party software directly connected to a vehicle.
- This scan-tool system is remotely accessed by Wi-Fi, cable, or cellular internet connection.
- Offers Self-Scan option for shop to perform pre or post-scans independently
- This method allows a diagnostic specialist to remotely log into the tool and take control to select the appropriate software and functionality needed for the vehicle connected.
- A remote diagnostic technician performs the scan-tool procedures needed for pre-or post-repair, scan data analysis, diagnostic functions, system calibrations or module programming in conjunction with available OEM and aftermarket service information sources.
- Vehicle communications stay resident at the vehicle the way scan tools are designed and intended to be used by the scan tool manufacturers.

Remote connected Scan-Tool via aftermarket IP connected interfaces

- This method is a patented process exclusive to the specific service provider.
- The hardware is an aftermarket communication interface that connects a vehicle's DLC port for conversion to TCIP (internet language) and transmitted to another aftermarket interface for conversion and connected to a scan-tool in a location other than the vehicle.
- Scan-tools are operated by diagnostic specialists who interpret vehicle data and codes with recommendations.
- A remote diagnostic technician performs the procedures needed for pre-or post-repair scan analysis, diagnostic functions, system calibrations or module programming in conjunction with available OEM and aftermarket service information sources.
- Scan-tool commands or procedures are then transmitted from the remote location back to the vehicle.
- Offers Mobile Technician assistance in some areas

Outsource: Sublet to a Mobile Diagnostic Specialty Service

Mobile service providers can take the pressure off a shop to acquire and maintain scan tools as well as performing hands on procedures beyond what a scan tool is capable of by itself. Mobile service providers usually have an assortment of aftermarket and OEM tool sources on hand appropriate for the procedures needed. Mobile technicians should have the equipment and ability to perform replacement module programming

- **Strengths:**
- Eliminates shop's need to employ and train diagnostic specialists
- Eliminates shop's need to purchase and maintain equipment
- Mobile service provider provides scan tools and equipment appropriate for services needed
- Module programming is available (depending on providers equipment and subscriptions)
- Security functions possible if mobile service provider has LSID registration
- Mobile service provider can perform hands on functions independently without shop personnel involvement
- Sublet invoice is provided

- **Weaknesses:**
- Some markets may not have available service providers
- Scheduling and availability of mobile services can delay work flow
- Work needed can be limited to a mobile tech's equipment and skill area (some mobile tech services are specialized)
- Scheduling conflicts can prohibit scanning or calibration functions resulting in shops going forward with repairs or delivery without a full assessment of a vehicle.

Outsource: Sublet programming, calibrations, and advanced diagnostic functions to a dealer or diagnostic specialty shop

This is a time-consuming process and is usually done after repairs have started and additional problems are present. Increases cost due to towing and rental expense. This is not feasible for a pre-repair or estimate process during blueprinting stage of repair estimate.

- **Strengths:**
- Module Programming is available
- Dealers can obtain security ID to perform security related component initializations
- ADAS calibrations available
- Same as mobile service provider

- **Weaknesses:**
- Increased cost transporting vehicle
- Increased cost per service
- Scheduling and wait time for diagnostic procedures
- Dealer services are limited to their OEM franchise
- Increases cycle time and rental expenses
- Non-dealer sources may be limited in capability

Review your personnel's training needs

1

Review past experiences and/or known capability gaps

Review your work mix by YMM and severity for specific manufacturer training needs

List specific repairs, procedures, and diagnostic difficulties that have affected your CSI, Profitability, and Cycle Time

Identify calibration or diagnostic procedures you may have been missing

2

Review shop personnel skills

Select a candidate for training in basic electrical and on-car diagnostic testing as needed

Consider recruiting and hiring a diagnostic scanning/calibration specialist

Consider training administration personnel in identifying and documenting diagnostic procedures.

3

I-Car www.i-car.com/Home/Educational-Programs/Vehicle-Technology-Specific-Training

ATG, Automotive training group www.atgtraining.com

CARQUEST Technical Institute

www.ctionline.com

Bosch Technical Training

https://aviondemand.com/bosch-training/technical-training/

OEM Training Sites

I-CAR Electric/Electronic System Training

Courtesy of I-Car

- Introduction to Diagnostics and Scan Tools VT210E01
- Basic Electronics Damage Analysis DAM13e
- Advanced Steering and Suspension Systems Damage Analysis DAM15
- Alternative Fuel Vehicle Damage Analysis ALT04e
- Alternative Fuel Vehicle Safety ALT05e
- Damage Analysis of Advanced Automotive Systems DAM07e
- Calibration of Front Facing Cameras and Front Radars VT200E01
- Safety Shield Technologies NI001E01
- Recently Launched Training!
  - Camera Calibration, Inspection, and Initialization Requirements VT215E01
  - Calibration Requirements for Blind Spot and Parking Assist Systems VT220E01
  - Steering Angle Sensor Overview and Diagnostics VT235E01
  - Windshields and Advanced Driver Assist Systems (ADAS) VT250E01

NEW! I-CAR Electric/Electronic System Training

Courtesy of I-Car

- Electronic Systems Diagnostics and Repair MK020V01
- Electrical Damage Inspection MK025E01
- Electrical Theory MK030E01
- Circuit Measurements with a Digital Volt Ohm Meter MK035E01
- Troubleshooting Basic Electrical Circuits MK180E01
- Wiring and Connector Service and Repairs MK185E01
- Initialization and Calibration of Electronic Systems MK190V01
- Control Module Programming Overview MK195V01
- Understanding Vehicle Communication Networks MK015E01
- Hybrid Vehicle Identification and Damage Analysis GE050E01
- Trim Removal and Installation MK001E01
- Removing Panels and Assemblies for Mechanical Access MK005E01
- Planning Mechanical Repairs MK010V01

SOP Considerations: When and Why to Scan

- Determine if unseen issues exist before repairs are started to be documented and discussed
- Vehicles that have extensive electronic systems
- Identify electronic systems that may be damaged or have set codes
- Identify control modules or sensors that need to be recalibrated or programmed following specific repairs
- Dynamic calibrations may require extended road test under specific conditions before final scan can be completed
- When codes need to be cleared and re-checked
- Verify safety systems are working correctly before delivery
- Quality Control, Road test, verify functionality

Understanding The Data

Can codes just be read and cleared?

- The person reading diagnostic information (Codes and Data) must be capable of interpreting what it means and apply the course for repairs using service information and on vehicle inspections
- Requires service information research to determine what codes indicate regarding the condition of the system being checked
- Pre-existing – loss related – repair related – diagnostics needed – parts needed - irrelevant
- It is necessary to do additional checks and tests to verify the condition of an electronic system
- It is necessary to reference OEM service information in conjunction with using the tool to evaluate an electronic system
- Scan tool data streams are used and analyzed for conditions that do not set trouble codes
- Codes may need to be cleared and re-checked when evaluating a system